

SEQUENCE LISTING

<110> Cindy Castado
Joelle Thonnard

<120> Novel Compounds

<130> B45292

<150> GB 0200025.5

<151> 2002-01-02

<160> 87

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 453

<212> DNA

<213> Haemophilus influenzae

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tattgctgga	aaaaaacact	tgtcaaaaat	taccgtttag	ttcactatcg	taaaccctct	240
aaaacgtcta	aacgtgcaat	catgtgtaca	acagcttatt	taattacttt	atctggcgct	300
caaaaactcc	tacaaatagc	ctatcctatc	cgtatgcctg	ctgactactt	aactgggtgct	360
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<210> 2

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<212> PRT

<213> Haemophilus influenzae

<400> 2

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			20					25					30		
Phe	Glu	Ala	Ile	Val	Lys	Asp	Ser	Leu	Lys	Lys	Val	Ser	Lys	Asn	Val
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Glu	Ile	Leu	Phe	Tyr	Asp	His	Gly	Lys	Ala	Lys	Ser	Tyr	Cys	Trp	Lys
	50				55						60				
Lys	Thr	Leu	Val	Lys	Asn	Tyr	Arg	Leu	Val	His	Tyr	Arg	Lys	Pro	Ser
65				70					75					80	
Lys	Thr	Ser	Lys	Arg	Ala	Ile	Met	Cys	Thr	Thr	Ala	Tyr	Leu	Ile	Thr
			85						90					95	
Leu	Ser	Gly	Ala	Gln	Lys	Leu	Leu	Gln	Ile	Ala	Tyr	Pro	Ile	Arg	Met
		100					105						110		
Pro	Ala	Asp	Tyr	Leu	Thr	Gly	Ala	Leu	Gln	Leu	Thr	Gly	Leu	Lys	Ala
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Asp Ala Met Glu Gln Arg
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<210> 3
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<212> DNA
<213> Haemophilus influenzae

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gacggaaaaa ttggggatta tgtggtgagc tcatttgtat tccgtgagat aaaaaaattt 180
aatccccaca ttaaaatttg tgtaatttgt accaaacaaa atgcttatct ttttaaacaa 240
aatccatata tcgatcaact ttactatgta aaaaagaaaa gtattttgga ttacatcaaa 300
tgtggtctag caattcaaaa agaacaatat gatttagtga ttgatccgac gattatgatt 360
cgtaatcgcg atcttttact tttacgctta atcaatgcc a gcattatat tggctaccaa 420
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tataaactcg ccttagaaaa agtgaatatt acggtacaag atataagcta tgacatccca 540
tttgataagc aaagtgcggt cgaaatttct gaatttttgc agaaaaacca actagaaaag 600
tatattgcta ttaattttta tggtgctgca agaatacaaaa aagtaaacia tgacaacatc 660
aaaaaatatt tagattatct cacgcaagtc cgcggaggaa aaaagctggg gctattaagc 720
tatcctgaag taacagagaa attaacacaa ttgtcagccg attatccgca tatttttgtc 780
catccaacia ccaagatctt tcataccatt gaattgattc gccactgtga tcaattaatc 840
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tataaagaag atcctattgc gtttacacat tggcaaccca gaagtcgggc agaaacgcac 960
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<212> PRT
<213> Haemophilus influenzae

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Arg Ser Ile Leu Phe Leu Arg Gln Asp Gly Lys Ile Gly Asp Tyr Val
35 40 45
Val Ser Ser Phe Val Phe Arg Glu Ile Lys Lys Phe Asn Pro His Ile
50 55 60
Lys Ile Gly Val Ile Cys Thr Lys Gln Asn Ala Tyr Leu Phe Lys Gln
65 70 75 80
Asn Pro Tyr Ile Asp Gln Leu Tyr Tyr Val Lys Lys Lys Ser Ile Leu
85 90 95
Asp Tyr Ile Lys Cys Gly Leu Ala Ile Gln Lys Glu Gln Tyr Asp Leu
100 105 110
Val Ile Asp Pro Thr Ile Met Ile Arg Asn Arg Asp Leu Leu Leu
115 120 125
Arg Leu Ile Asn Ala Lys His Tyr Ile Gly Tyr Gln Lys Ala Asn Tyr
130 135 140
Gly Leu Phe Asn Ile Asn Leu Glu Gly Gln Phe His Phe Ser Glu Leu

145					150					155				160
Tyr	Lys	Leu	Ala	Leu	Glu	Lys	Val	Asn	Ile	Thr	Val	Gln	Asp	Ile
				165					170					175
Tyr	Asp	Ile	Pro	Phe	Asp	Lys	Gln	Ser	Ala	Val	Glu	Ile	Ser	Glu
			180					185					190	
Leu	Gln	Lys	Asn	Gln	Leu	Glu	Lys	Tyr	Ile	Ala	Ile	Asn	Phe	Tyr
		195					200					205		
Ala	Ala	Arg	Ile	Lys	Lys	Val	Asn	Asn	Asp	Asn	Ile	Lys	Lys	Tyr
	210					215					220			
Asp	Tyr	Leu	Thr	Gln	Val	Arg	Gly	Gly	Lys	Lys	Leu	Val	Leu	Ser
225					230				235					240
Tyr	Pro	Glu	Val	Thr	Glu	Lys	Leu	Thr	Gln	Leu	Ser	Ala	Asp	Tyr
				245					250					255
His	Ile	Phe	Val	His	Pro	Thr	Thr	Lys	Ile	Phe	His	Thr	Ile	Glu
		260						265					270	
Ile	Arg	His	Cys	Asp	Gln	Leu	Ile	Ser	Thr	Asp	Thr	Ser	Thr	Val
	275					280						285		
Ile	Ala	Ser	Gly	Phe	Asn	Lys	Pro	Ile	Ile	Gly	Ile	Tyr	Lys	Glu
	290				295						300			
Pro	Ile	Ala	Phe	Thr	His	Trp	Gln	Pro	Arg	Ser	Arg	Ala	Glu	Thr
305					310					315				320
Ile	Leu	Phe	Tyr	Lys	Glu	Asn	Ile	Asn	Glu	Leu	Ser	Pro	Glu	Gln
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<210> 5
 <211> 813
 <212> DNA
 <213> Haemophilus influenzae

<400> 5																			
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ttagcgcaaa	ttacacaaca	aaaagtcatc	gcattaagtc	gccgtgcgaa	gtatttaatt														180
atccaacttg	aaacaggcta	tatgattgga	catttaggga	tgtcagggtc	attgagagtt														240
gtggagaaaag	gggatcttat	tgataaacat	gatcatcttg	atatcgtagt	gaataacgga														300
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gattacttgt	ggcaaaaaag	tcgtaaaaaa	cagaccgcac	ttaaaacttt	tttaatggat														480
aatgctgtcg	tcgttggcgt	tggaatatc	tatgcgaatg	aaacgttatt	tctttgtaac														540
ctacatccgc	aaaaaacagc	agggagttaa	actaaggcac	aatgtgggca	gttagtagaa														600
caaataaaaac	aagtgtgtgc	taacgcaatc	caacaagggtg	gtacgacgct	aaaagatttt														660
ctccaaccgg	atgggcgtcc	aggctatatt	gtccaagaat	tgcggtttta	tggtataaag														720
gataagcctt	gtccaacatg	tggcacaata	atagaaagtt	tagtgatagg	gcaacgaaat														780
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<210> 6
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 <212> PRT
 <213> Haemophilus influenzae

<400> 6														
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 20 25 30
 Leu Arg Trp Met Val Ser Glu Glu Leu Ala Gln Ile Thr Gln Gln Lys
 35 40 45
 Val Ile Ala Leu Ser Arg Arg Ala Lys Tyr Leu Ile Ile Gln Leu Glu
 50 55 60
 Thr Gly Tyr Met Ile Gly His Leu Gly Met Ser Gly Ser Leu Arg Val
 65 70 75 80
 Val Glu Lys Gly Asp Leu Ile Asp Lys His Asp His Leu Asp Ile Val
 85 90 95
 Val Asn Asn Gly Lys Val Val Arg Tyr Asn Asp Pro Arg Arg Phe Gly
 100 105 110
 Ala Trp Leu Trp Thr Glu Lys Leu Asn Glu Phe Pro Leu Phe Leu Lys
 115 120 125
 Leu Gly Pro Glu Pro Leu Ser Glu Glu Phe Asp Ser Asp Tyr Leu Trp
 130 135 140
 Gln Lys Ser Arg Lys Lys Gln Thr Ala Leu Lys Thr Phe Leu Met Asp
 145 150 155 160
 Asn Ala Val Val Val Gly Val Gly Asn Ile Tyr Ala Asn Glu Thr Leu
 165 170 175
 Phe Leu Cys Asn Leu His Pro Gln Lys Thr Ala Gly Ser Leu Thr Lys
 180 185 190
 Ala Gln Cys Gly Gln Leu Val Glu Gln Ile Lys Gln Val Leu Ser Asn
 195 200 205
 Ala Ile Gln Gln Gly Gly Thr Thr Leu Lys Asp Phe Leu Gln Pro Asp
 210 215 220
 Gly Arg Pro Gly Tyr Phe Val Gln Glu Leu Arg Val Tyr Gly Asn Lys
 225 230 235 240
 Asp Lys Pro Cys Pro Thr Cys Gly Thr Lys Ile Glu Ser Leu Val Ile
 245 250 255
 Gly Gln Arg Asn Ser Phe Tyr Cys Pro Lys Cys Gln Lys Arg
 260 265 270

<210> 7

<211> 726

<212> DNA

<213> Haemophilus influenzae

<400> 7

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cgcattgagc	aaggggaaaa	agtggatttg	tttgcctctg	ccaatgatgc	gcatcttagg	180
catttacaag	cgcgatatcc	tcatattcaa	cttgtgcctt	ttgctacaaa	tcgtttatgt	240
ttaattgcaa	agaaatcgg	gattactcac	catgatgaga	attggttgac	attattgatg	300
tcgccccact	tacgcttagg	agtatcgaca	cctaaggcag	atccttgtgg	agattatact	360
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aaagcaatgg	caatagttgg	tgggtccggat	tctatcacta	ttccaacagg	acgaaatacc	480
gcagagtggc	tttttgagca	gaattatgct	gatcttttca	ttggttatgc	gagtaatcat	540
caatctttgc	gtcagcattc	tgatatttgt	gttttggata	ttcctgatga	gtataatgtg	600
agggcgaa	ctacattagc	agcttttact	gcggaagcat	tacgccttgt	ggactccttg	660
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<210> 8

<211> 241

<212> PRT
 <213> Haemophilus influenzae

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 Gly Pro Ala Gly Leu Leu Cys Gln Arg Ile Glu Gln Gly Glu Lys Val
 35 40 45
 Asp Leu Phe Ala Ser Ala Asn Asp Ala His Leu Arg His Leu Gln Ala
 50 55 60
 Arg Tyr Pro His Ile Gln Leu Val Pro Phe Ala Thr Asn Arg Leu Cys
 65 70 75 80
 Leu Ile Ala Lys Lys Ser Val Ile Thr His His Asp Glu Asn Trp Leu
 85 90 95
 Thr Leu Leu Met Ser Pro His Leu Arg Leu Gly Val Ser Thr Pro Lys
 100 105 110
 Ala Asp Pro Cys Gly Asp Tyr Thr Leu Ala Leu Phe Ser Asn Ile Glu
 115 120 125
 Lys Arg His Met Gly Tyr Gly Ser Glu Leu Lys Glu Lys Ala Met Ala
 130 135 140
 Ile Val Gly Gly Pro Asp Ser Ile Thr Ile Pro Thr Gly Arg Asn Thr
 145 150 155 160
 Ala Glu Trp Leu Phe Glu Gln Asn Tyr Ala Asp Leu Phe Ile Gly Tyr
 165 170 175
 Ala Ser Asn His Gln Ser Leu Arg Gln His Ser Asp Ile Cys Val Leu
 180 185 190
 Asp Ile Pro Asp Glu Tyr Asn Val Arg Ala Asn Tyr Thr Leu Ala Ala
 195 200 205
 Phe Thr Ala Glu Ala Leu Arg Leu Val Asp Ser Leu Leu Cys Leu Thr
 210 215 220
 Cys Gly Gln Lys Tyr Leu Arg Asp Cys Gly Phe Leu Pro Ala Asn His
 225 230 235 240
 Ser

<210> 9
 <211> 741
 <212> DNA
 <213> Haemophilus influenzae

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 aaaggtaaaa ccacattatt gcattctctt gctcatgtgt tacctgttat gtctggacag 180
 attaggcaac aaggtcatat tggttttgtg ccacagtctt tttcgtcgcc agattatccc 240
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 aaaacggatg aaacagtcgc attacagatg ttggcgtgct tagacatcct gcatttagct 360
 gagcgcaata tcaatatgct ttcgggcggt caacgccaac ttgtgctcat cgctcgtgca 420
 cttgcgacag aatgtcaggt cctcatttta gatgaacctt cagcagcatt ggatgtttat 480
 aatcaatagc gtgtcttaca acttatacgt tttcttgcaa cggaacaaaa aatgaccatt 540
 attttttcca ctcatgatcc ttatcacagt ttatgtgtgg cagataatgt gttattgcta 600
 ttgcctaacc aacaatggaa atatggaata gccagtcaaa ttttaacgga atctcatttg 660
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741

<210> 10
 <211> 246
 <212> PRT
 <213> Haemophilus influenzae

<220>
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 <223> Xaa = Any Amino Acid

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 20 25 30
 Ile Ser Val Phe Gly Thr Asn Gly Lys Gly Lys Thr Thr Leu Leu His
 35 40 45
 Ser Leu Ala His Val Leu Pro Val Met Ser Gly Gln Ile Arg Gln Gln
 50 55 60
 Gly His Ile Gly Phe Val Pro Gln Ser Phe Ser Ser Pro Asp Tyr Pro
 65 70 75 80
 Val Leu Glu Ile Val Leu Met Gly Arg Ala Ser Lys Ile Gly Ala Phe
 85 90 95
 Asn Leu Pro Ser Lys Thr Asp Glu Thr Val Ala Leu Gln Met Leu Ala
 100 105 110
 Cys Leu Asp Ile Leu His Leu Ala Glu Arg Asn Ile Asn Met Leu Ser
 115 120 125
 Gly Gly Gln Arg Gln Leu Val Leu Ile Ala Arg Ala Leu Ala Thr Glu
 130 135 140
 Cys Gln Val Leu Ile Leu Asp Glu Pro Thr Ala Ala Leu Asp Val Tyr
 145 150 155 160
 Asn Gln Xaa Arg Val Leu Gln Leu Ile Arg Phe Leu Ala Thr Glu Gln
 165 170 175
 Lys Met Thr Ile Ile Phe Ser Thr His Asp Pro Tyr His Ser Leu Cys
 180 185 190
 Val Ala Asp Asn Val Leu Leu Leu Leu Pro Asn Gln Gln Trp Lys Tyr
 195 200 205
 Gly Ile Ala Ser Gln Ile Leu Thr Glu Ser His Leu Lys Gln Ala Tyr
 210 215 220
 Asn Val Pro Ile Lys Tyr Ser Met Ile Glu Glu Gln Gln Val Leu Val
 225 230 235 240
 Pro Ile Phe Thr Ile Gln
 245

<210> 11
 <211> 1023
 <212> DNA
 <213> Haemophilus influenzae

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 tccattttat ctaagccttt tctttcgcaa cagcgtctt ttacacctat ggaataccat 180

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attgtttggc atgtacgctt accacgcac accatggcat ttttttcagg ggggatctga 240
gcatgagtg gtgcaacact acagggcggt tttcataatc cccttggtga tcctcatatt 300
attggtgtca catcaggggc agtttttgga ggcagtttag caattttatt aggattccca 360
tcttatttat tgattctatc cacattttct tttggtttat tgacattatt cttgatctat 420
gtaaccacaa tgttcatcgg aaaaggcaat cgtattgtat tagtttttagc ggggtgtcatt 480
ttaagtgggt tcttttagcac tctagtggag ttaatccaat atttagcgga tgcagaagaa 540
gttctgccga gcattgtatt ttggttatta ggaagttttg ccaccactag ttgggcaaaa 600
ctagctatat tgttaccctg cgtttttatt gcagcttatt tattattccg tttacgggtgg 660
catattaatg tgttatcgct aggtgatatg caagcaaaaa tgttaggcgt ttccattaag 720
aaaatgcgtt ggtttgtttt gctactttgt gcattgcttg tagcaacaca agtcgctggt 780
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<210> 12
<211> 340
<212> PRT
<213> Haemophilus influenzae

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<220>
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<223> Xaa = Any Amino Acid

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20 25 30
Ser Leu Ser Thr Gly Lys Val Met Ser Ile Leu Ser Lys Pro Phe Leu
35 40 45
Ser Gln His Ala Ser Phe Thr Pro Met Glu Tyr His Ile Val Trp His
50 55 60
Val Arg Leu Pro Arg Ile Ile Met Ala Phe Phe Ser Gly Gly Ile Xaa
65 70 75 80
Ala Met Ser Gly Ala Thr Leu Gln Gly Val Phe His Asn Pro Leu Val
85 90 95
Asp Pro His Ile Ile Gly Val Thr Ser Gly Ala Val Phe Gly Gly Ser
100 105 110
Leu Ala Ile Leu Leu Gly Phe Pro Ser Tyr Leu Leu Ile Leu Ser Thr
115 120 125
Phe Ser Phe Gly Leu Leu Thr Leu Phe Leu Ile Tyr Val Thr Thr Met
130 135 140
Phe Ile Gly Lys Gly Asn Arg Ile Val Leu Val Leu Ala Gly Val Ile
145 150 155 160
Leu Ser Gly Phe Phe Ser Thr Leu Val Ser Leu Ile Gln Tyr Leu Ala
165 170 175
Asp Ala Glu Glu Val Leu Pro Ser Ile Val Phe Trp Leu Leu Gly Ser
180 185 190
Phe Ala Thr Thr Ser Trp Ala Lys Leu Ala Ile Leu Leu Pro Cys Val
195 200 205
Phe Ile Ala Ala Tyr Leu Leu Phe Arg Leu Arg Trp His Ile Asn Val
210 215 220

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Leu Ser Leu Gly Asp Met Gln Ala Lys Met Leu Gly Val Ser Ile Lys
 225 230 235 240
 Lys Met Arg Trp Phe Val Leu Leu Leu Cys Ala Leu Leu Val Ala Thr
 245 250 255
 Gln Val Ala Val Ser Gly Ser Ile Gly Trp Ile Gly Leu Val Ile Pro
 260 265 270
 His Leu Thr Arg Phe Phe Val Gly Ser Asp His Arg Tyr Leu Leu Pro
 275 280 285
 Ala Ser Phe Leu Ile Gly Gly Ile Phe Met Ile Val Ile Asp Thr Leu
 290 295 300
 Ala Arg Thr Leu Thr Ser Ala Glu Ile Pro Val Gly Ile Ile Thr Ala
 305 310 315 320
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 325 330 335
 Lys Lys Ser Leu
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<210> 13
 <211> 942
 <212> DNA
 <213> Haemophilus influenzae

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 gatgaagtta atcgtgttgt tgtctgacag catcagactt taaatctcct tgcccagctt 180
 gatgcaaagg aaagtgtagt cggagtgtta tcaagttgga aaaaacaatt agggaaaaac 240
 tatgcaccaa aagaaatgat tgagcaaadc gaacaggctg gtgtgcctgt tgtagccatt 300
 tctttgcgtg aagataaaaa aggtgaagaa ggaaaagtca acccagaaat ggaagatgaa 360
 gaagttgcct ataataatgg tttgaaacaa ggcattttatt taattggtga agtaattaat 420
 cgacaagcgc aagcccaaaa gctagttact tacacttttg aacagcgtga attagtgagt 480
 caacgtttta gtaagggtgc tgatgagcag cgtgttaggg tctatatattgc aaatccagat 540
 ttagcgactt atggttcttg aaaatataca gggtaaatga tgcttcatgc tggagcgaag 600
 aatgtggcag ctgaaacaat aaaaggtttt aaacaagttt cgattgagca agtgattcat 660
 tggaaatcct cagttatctt cgtacaggaa cgttatcctc aggttatcga gcaaattaaa 720
 aaggatccct cttggcaaat tattgatgcg gtgaaaaatc aacgtatcta tttaatgccg 780
 gaatatgcaa aagcgtgggg atatccaatg cctgaagcat tagcgattgg tgaattatgg 840
 ttagcaaaac aactttacc tgaattgttt gcagatgttg atttagagga aaaagtaaac 900
 caatactata aattgttcta tcgtatgcca tataaccagt aa 942

<210> 14
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 <212> PRT
 <213> Haemophilus influenzae

<220>
 <221> VARIANT
 <222> (1)...(313)
 <223> Xaa = Any Amino Acid

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 20 25 30

Leu	Gly	Arg	Lys	Val	Thr	Ile	Pro	Asp	Glu	Val	Asn	Arg	Val	Val	Val
		35					40				45				
Xaa	Gln	His	Gln	Thr	Leu	Asn	Leu	Leu	Ala	Gln	Leu	Asp	Ala	Lys	Glu
	50					55					60				
Ser	Val	Val	Gly	Val	Leu	Ser	Ser	Trp	Lys	Lys	Gln	Leu	Gly	Lys	Asn
	65				70					75					80
Tyr	Ala	Pro	Lys	Glu	Met	Ile	Glu	Gln	Ile	Glu	Gln	Ala	Gly	Val	Pro
			85					90						95	
Val	Val	Ala	Ile	Ser	Leu	Arg	Glu	Asp	Lys	Lys	Gly	Glu	Glu	Gly	Lys
			100					105						110	
Val	Asn	Pro	Glu	Met	Glu	Asp	Glu	Val	Ala	Tyr	Asn	Asn	Gly	Leu	
		115					120				125				
Lys	Gln	Gly	Ile	Tyr	Leu	Ile	Gly	Glu	Val	Ile	Asn	Arg	Gln	Ala	Gln
	130					135					140				
Ala	Gln	Lys	Leu	Val	Thr	Tyr	Thr	Phe	Glu	Gln	Arg	Glu	Leu	Val	Ser
	145				150					155					160
Gln	Arg	Leu	Ser	Lys	Val	Pro	Asp	Glu	Gln	Arg	Val	Arg	Val	Tyr	Ile
			165					170						175	
Ala	Asn	Pro	Asp	Leu	Ala	Thr	Tyr	Gly	Ser	Gly	Lys	Tyr	Thr	Gly	Leu
			180					185					190		
Met	Met	Leu	His	Ala	Gly	Ala	Lys	Asn	Val	Ala	Ala	Glu	Thr	Ile	Lys
		195					200					205			
Gly	Phe	Lys	Gln	Val	Ser	Ile	Glu	Gln	Val	Ile	His	Trp	Asn	Pro	Ala
	210					215					220				
Val	Ile	Phe	Val	Gln	Glu	Arg	Tyr	Pro	Gln	Val	Ile	Glu	Gln	Ile	Lys
	225				230				235						240
Lys	Asp	Pro	Ser	Trp	Gln	Ile	Ile	Asp	Ala	Val	Lys	Asn	Gln	Arg	Ile
			245					250						255	
Tyr	Leu	Met	Pro	Glu	Tyr	Ala	Lys	Ala	Trp	Gly	Tyr	Pro	Met	Pro	Glu
			260					265					270		
Ala	Leu	Ala	Ile	Gly	Glu	Leu	Trp	Leu	Ala	Lys	Gln	Leu	Tyr	Pro	Glu
		275					280					285			
Leu	Phe	Ala	Asp	Val	Asp	Leu	Glu	Glu	Lys	Val	Asn	Gln	Tyr	Tyr	Lys
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Leu	Phe	Tyr	Arg	Met	Pro	Tyr	Asn	Gln							
	305				310										

<210> 15

<211> 558

<212> DNA

<213> Haemophilus influenzae

<400> 15

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cgtttaaadc	gaacagattt	acgtattaac	cgccttggcg	caagtgctgc	ggcgttggct	240
tcattaaaaac	ctgcacaatt	aggcgaagat	gataaatttg	cattatcttt	gggcgttggt	300
agttataaaa	atgcgcaggc	gatggcaatg	ggggctgtgt	ttaagccagc	tgaaaacgta	360
ttgcttaaatg	tagcggggag	tttttctggt	tcggaaaaaa	cctttggcgc	agggtgtttct	420
tggaaattcg	gcagcaaadc	caaacctgcg	gtttcaacac	aaagtgcggt	caattctgcg	480
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<210> 16

<211> 185
 <212> PRT
 <213> Haemophilus influenzae

<400> 16
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 Ile Ser Thr Ser Phe Tyr Ser Val Gln Ser Phe Val Ala Asp Ser Ser
 20 25 30
 Asp Lys Thr Trp Gln Leu Gln Thr Gly Gln Gly Leu Asp Ala Lys Ile
 35 40 45
 Gly Gln Val Asn Asn Gln Phe Thr Gln Val Asp Thr Arg Leu Asn Arg
 50 55 60
 Thr Asp Leu Arg Ile Asn Arg Leu Gly Ala Ser Ala Ala Ala Leu Ala
 65 70 75 80
 Ser Leu Lys Pro Ala Gln Leu Gly Glu Asp Asp Lys Phe Ala Leu Ser
 85 90 95
 Leu Gly Val Gly Ser Tyr Lys Asn Ala Gln Ala Met Ala Met Gly Ala
 100 105 110
 Val Phe Lys Pro Ala Glu Asn Val Leu Leu Asn Val Ala Gly Ser Phe
 115 120 125
 Ser Gly Ser Glu Lys Thr Phe Gly Ala Gly Val Ser Trp Lys Phe Gly
 130 135 140
 Ser Lys Ser Lys Pro Ala Val Ser Thr Gln Ser Ala Val Asn Ser Ala
 145 150 155 160
 Glu Val Leu Gln Leu Arg Gln Glu Ile Ser Ala Met Gln Lys Glu Leu
 165 170 175
 Ala Glu Leu Lys Lys Ala Leu Arg Lys
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<210> 17
 <211> 2373
 <212> DNA
 <213> Haemophilus influenzae

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 cgctgtttgg atactttact tgagccaagc aaagatgccg tattggaaga aatgcgtttt 180
 caaaaagaag aattggcatt caccgaattg gatgacctt cccttaaaaa aattaccggt 240
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 acgccgcagt atatgctggc caattttgaa gaatatcttg atggtttcag caccaacatt 360
 catgaaatca tcaactgctt caagctgctg gaacaaatcc gccatatgtc ccataaaaaat 420
 gttttgctga gcgtgttggg aaaatttgta tcgccctata tcaatcttac ccctaaagaa 480
 caacaagacc ctgagggcaa caaattacca gcgctgacca atctgggcat gggctatgta 540
 tttgaagaac tgattcgtaa atttaacgaa gaaaataacg aagaagctgg cgaacacttt 600
 accccacgcg aagtgatcga gctgatgacg catttagtct ttgatccgct caaagaccaa 660
 attccggcca ttattacgat ttacgacca gcttgcgga gcggtggcat gctgaccgag 720
 tcgcaaaact ttattgagca aaaatatccg ctatctgaat cacaaggcga gcgttccatc 780
 tttttgtttg gtaaagaaac caatgatgaa acctatgcc a tttgtaaatc tgacatgatg 840
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 gatcaagcct atatcaaaga cggcaatgag gttatcgaca gtcgctttta agttacctta 1020
 ccagattact ggggcaatgt agaaaccctt gatgctaccc cacgctccag cgatggacag 1080
 ctgctattcc taatggaaat ggtcagcaaa atgaaatcgc cgaatgacaa caaaatcggc 1140

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ttgcgtaaaa accttggcga taaaaactgc gaatttgtac ctgaacatat cgccgaaatt 1440
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gaatatatcc tatatgaaac gagcagcgac ttgcgcgaca gcgaatccat accgctcaaa 2160
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aatatggaag gcgtaaaaat cggctatgaa atcagcttca acaaatactt ctaccgccac 2280
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<210> 18

<211> 790

<212> PRT

<213> Haemophilus influenzae

<400> 18

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 20          25          30
Val Ile Leu Pro Met Phe Val Leu Arg Arg Leu Asp Thr Leu Leu Glu
 35          40          45
Pro Ser Lys Asp Ala Val Leu Glu Glu Met Arg Phe Gln Lys Glu Glu
 50          55          60
Leu Ala Phe Thr Glu Leu Asp Asp Leu Pro Leu Lys Lys Ile Thr Gly
 65          70          75          80
His Val Phe Tyr Asn Thr Ser Lys Trp Thr Leu Lys Ser Leu Tyr Gln
 85          90          95
Thr Ala Ser Asn Thr Pro Gln Tyr Met Leu Ala Asn Phe Glu Glu Tyr
100          105          110
Leu Asp Gly Phe Ser Thr Asn Ile His Glu Ile Ile Asn Cys Phe Lys
115          120          125
Leu Arg Glu Gln Ile Arg His Met Ser His Lys Asn Val Leu Leu Ser
130          135          140
Val Leu Glu Lys Phe Val Ser Pro Tyr Ile Asn Leu Thr Pro Lys Glu
145          150          155          160
Gln Gln Asp Pro Glu Gly Asn Lys Leu Pro Ala Leu Thr Asn Leu Gly
165          170          175
Met Gly Tyr Val Phe Glu Glu Leu Ile Arg Lys Phe Asn Glu Glu Asn
180          185          190
Asn Glu Glu Ala Gly Glu His Phe Thr Pro Arg Glu Val Ile Glu Leu
195          200          205
Met Thr His Leu Val Phe Asp Pro Leu Lys Asp Gln Ile Pro Ala Ile

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210	Ile Thr Ile Tyr Asp	215	Pro Ala Cys Gly Ser	220	Gly Gly Met Leu Thr Glu
225	Ser Gln Asn Phe Ile	230	Glu Gln Lys Tyr Pro	235	Leu Ser Glu Ser Gln Gly
		245	Leu Phe Gly Lys Glu	250	Thr Asn Asp Glu Thr Tyr
		260		265	
Ala Ile Cys Lys Ser Asp Met Met Ile Lys Gly Asp Asn Pro Glu Asn		275		280	
		285		290	
Ile Lys Val Gly Ser Thr Leu Ala Thr Asp Ser Phe Gln Gly Asn His		295		300	
		305		310	
Phe Asp Phe Met Leu Ser Asn Pro Pro Tyr Gly Lys Ser Trp Ser Lys		315		320	
		325		330	
Asp Gln Ala Tyr Ile Lys Asp Gly Asn Glu Val Ile Asp Ser Arg Phe		335		340	
		345		350	
Lys Val Thr Leu Pro Asp Tyr Trp Gly Asn Val Glu Thr Leu Asp Ala		355		360	
		365		370	
Thr Pro Arg Ser Ser Asp Gly Gln Leu Leu Phe Leu Met Glu Met Val		375		380	
		385		390	
Ser Lys Met Lys Ser Pro Asn Asp Asn Lys Ile Gly Ser Arg Val Ala		395		400	
		405		410	
Ser Val His Asn Gly Ser Ser Leu Phe Thr Gly Asp Ala Gly Ser Gly		415		420	
		425		430	
Glu Ser Asn Ile Arg Arg His Ile Ile Glu Lys Asp Leu Leu Glu Ala		435		440	
		445		450	
Ile Val Gln Leu Pro Asn Asn Leu Phe Tyr Asn Thr Gly Ile Thr Thr		455		460	
		465		470	
Tyr Ile Trp Leu Leu Ser Asn Asn Lys Pro Glu Ala Arg Lys Lys Lys		475		480	
		485		490	
Val Gln Leu Ile Asp Ala Ser Leu Leu Phe Arg Lys Leu Arg Lys Asn		495		500	
		505		510	
Leu Gly Asp Lys Asn Cys Glu Phe Val Pro Glu His Ile Ala Glu Ile		515		520	
		525		530	
Thr Gln Asn Tyr Leu Asp Phe Thr Ala Lys Ala Arg Glu Thr Asp Ser		535		540	
		545		550	
Gln Asn Glu Ala Val Gly Leu Ala Ser Gln Ile Phe Asp Asn Gln Asp		555		560	
		565		570	
Phe Gly Tyr Tyr Lys Val Thr Ile Glu Arg Pro Asp Arg Arg Ser Ala		575		580	
		585		590	
Gln Phe Thr Ala Glu Asn Ile Ser Pro Leu Arg Phe Asp Lys Ala Leu		595		600	
		605		610	
Phe Glu Pro Met Gln Tyr Leu Tyr Arg Gln Tyr Gly Glu Gln Ile Tyr		615		620	
		625		630	
Asn Ala Gly Phe Leu Ala Gln Thr Glu Gln Glu Ile Thr Ala Trp Cys		635		640	
		645		650	
Glu Ala Gln Gly Ile Ala Leu Asn Asn Lys Asn Lys Thr Lys Leu Leu		655			
Asp Val Lys Thr Trp Glu Lys Ala Ala Ala Leu Phe Gln Thr Ala Ser					
Thr Leu Leu Glu His Phe Gly Glu Gln Gln Phe Asp Asp Phe Asn Gln					
Phe Lys Gln Ala Val Glu Cys Arg Leu Lys Ala Glu Lys Ile Pro Leu					
Ser Ala Thr Glu Lys Lys Ala Val Phe Asn Ala Val Ser Trp Tyr Asp					

Glu Asn Ser Ala Lys Val Ile Ala Lys Thr Leu Lys Leu Lys Pro Asn
 660 665 670
 Glu Leu Asp Ala Leu Cys Gln Arg Tyr Gln Cys Gln Ala Asp Glu Leu
 675 680 685
 Ala Asp Phe Gly Tyr Tyr Ala Thr Gly Lys Ala Gly Glu Tyr Ile Leu
 690 695 700
 Tyr Glu Thr Ser Ser Asp Leu Arg Asp Ser Glu Ser Ile Pro Leu Lys
 705 710 715 720
 Gln Asn Ile His Asp Tyr Phe Lys Ala Glu Val Gln Ala His Ile Ser
 725 730 735
 Glu Ala Trp Leu Asn Met Glu Ser Val Lys Ile Gly Tyr Glu Ile Ser
 740 745 750
 Phe Asn Lys Tyr Phe Tyr Arg His Lys Pro Leu Arg Ser Leu Ala Glu
 755 760 765
 Val Ala Gln Asp Ile Leu Ala Leu Glu Lys Gln Ala Asp Gly Leu Ile
 770 775 780
 Ser Glu Ile Leu Glu Ala
 785 790

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 <211> 818
 <212> DNA
 <213> Haemophilus influenzae

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 tatcggaat tggttttcga ttttattgca ccgccttgtc ggattggact ggaagaaatt 240
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 atagttcctg attttaatga agaagattta gatcaagaat tattagagct atataaaaag 480
 aaagttaatt ttacctccga taatatctta gatttattat acaagcgaaa tttattaacc 540
 aaaaaggaag gttgttatca gtttaaaaaa tcagccattt tactcttttc taccatgccg 600
 gaacgttaca ttccttcagc atcagtcgcc tatgttcggt atgaaggtag agtagcgaaa 660
 gtcggtactg agcataatgt gataaaagac caacgttttg aaaataatat tccaaagcta 720
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<210> 20
 <211> 272
 <212> PRT
 <213> Haemophilus influenzae

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 20 25 30
 Ala Asp Gly Gly Val Leu Ala Phe Gly Val Ala Asp Asn Gly Glu Ile
 35 40 45
 Gln Asp Leu Asn Ser Leu Gly Asp Lys Leu Asp Asp Tyr Arg Lys Leu
 50 55 60
 Val Phe Asp Phe Ile Ala Pro Pro Cys Arg Ile Gly Leu Glu Glu Ile

65					70					75				80	
Leu	Val	Asp	Gly	Lys	Leu	Val	Phe	Leu	Phe	His	Val	Glu	Gln	Asp	Leu
				85					90					95	
Glu	Arg	Ile	Tyr	Cys	Arg	Lys	Asp	Asn	Glu	Asn	Val	Phe	Leu	Arg	Val
			100					105					110		
Ala	Asp	Ser	Asn	Arg	Gly	Pro	Leu	Thr	Arg	Glu	Gln	Ile	Lys	Asn	Leu
		115					120					125			
Glu	Tyr	Asp	Lys	Asn	Ile	Arg	Leu	Phe	Glu	Asp	Glu	Ile	Val	Pro	Asp
	130				135						140				
Phe	Asn	Glu	Glu	Asp	Leu	Asp	Gln	Glu	Leu	Leu	Glu	Leu	Tyr	Lys	Lys
145					150				155						160
Lys	Val	Asn	Phe	Thr	Ser	Asp	Asn	Ile	Leu	Asp	Leu	Leu	Tyr	Lys	Arg
				165					170					175	
Asn	Leu	Leu	Thr	Lys	Lys	Glu	Gly	Cys	Tyr	Gln	Phe	Lys	Lys	Ser	Ala
			180					185					190		
Ile	Leu	Leu	Phe	Ser	Thr	Met	Pro	Glu	Arg	Tyr	Ile	Pro	Ser	Ala	Ser
		195					200					205			
Val	Arg	Tyr	Val	Arg	Tyr	Glu	Gly	Thr	Val	Ala	Lys	Val	Gly	Thr	Glu
		210				215					220				
His	Asn	Val	Ile	Lys	Asp	Gln	Arg	Phe	Glu	Asn	Asn	Ile	Pro	Lys	Leu
225					230					235					240
Ile	Glu	Glu	Leu	Thr	Tyr	Phe	Leu	Arg	Ala	Ser	Leu	Arg	Asp	Tyr	Tyr
			245					250						255	
Phe	Leu	Asp	Val	Asn	Gln	Gly	Lys	Phe	Ile	Lys	Val	Pro	Glu	Tyr	Pro
			260					265						270	

<210> 21
 <211> 636
 <212> DNA
 <213> Haemophilus influenzae

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aaacatttcg	acgatcgtct	tgaaattagt	aatagtggcc	ctctccctgc	tcaagtcacc													180
attgaaaata	ttaaaacgga	acgattcgct	cggaatccac	gtatagcacg	agttttagag													240
gatcttgggt	atgtccgtca	gcttaatgaa	ggcgtttccc	gtatttatga	gtcaatggaa													300
aaatcattat	tggcaaagcc	tgaatataga	gaacaaaaca	acaatgttta	tctaacattg													360
cgcaaccgtg	ttaccgcaca	tgaaaaaacg	gtatctacag	ccactatgct	gcagattgaa													420
aaagaatgga	caaactacaa	cgacacccaa	aaagccattt	tgctttatct	atttacaat													480
ggtacggcga	tattgtcaga	attagttgac	tatacaaaaa	tcaatcagaa	ttcgatccga													540
gcgtatttaa	atgcctttat	tcagcaaggt	attattgaaa	gacaaagtgt	aaaacagcgt													600
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<210> 22
 <211> 211
 <212> PRT
 <213> Haemophilus influenzae

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Ala	Trp	Leu	Glu	Gly	Val	Val	Asn	Ala	Leu	Cys	His	Arg	Ser	Tyr	Asn			
			20				25						30					
Val	Gln	Gly	Asn	Val	Ile	Tyr	Ile	Lys	His	Phe	Asp	Asp	Arg	Leu	Glu			

<213> Haemophilus influenzae

<400> 24

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Leu	Gly	Glu	Val	Pro	Ser	His	Trp	Glu	Leu	Lys	Arg	Leu	Lys	Gln	Leu	20	25	30	
Phe	Val	Glu	Lys	Lys	His	Lys	Gln	Ser	Leu	Ser	Leu	Asn	Cys	Gly	Ala	35	40	45	
Ile	Ser	Phe	Gly	Lys	Val	Ile	Glu	Lys	Ser	Asp	Asp	Lys	Val	Thr	Glu	50	55	60	
Ala	Thr	Lys	Arg	Ser	Tyr	Gln	Glu	Val	Leu	Lys	Gly	Glu	Phe	Leu	Ile	65	70	75	80
Asn	Pro	Leu	Asn	Leu	Asn	Tyr	Asp	Leu	Ile	Ser	Leu	Arg	Ile	Ala	Leu	85	90	95	
Ser	Glu	Ile	Asp	Val	Val	Val	Ser	Ala	Gly	Tyr	Ile	Val	Leu	Lys	Glu	100	105	110	
Lys	Gln	Ile	Ile	Asn	Lys	Lys	Tyr	Phe	Ser	Tyr	Leu	Leu	His	Arg	Tyr	115	120	125	
Asp	Val	Ala	Tyr	Met	Lys	Leu	Leu	Gly	Ser	Gly	Val	Arg	Gln	Thr	Ile	130	135	140	
Asn	Tyr	Gly	His	Ile	Ser	Asp	Ser	Ile	Leu	Val	Ile	Pro	Pro	Leu	Ser	145	150	155	160
Glu	Gln	Gln	Lys	Ile	Ala	Gln	Phe	Leu	Asp	Asp	Lys	Thr	Ala	Lys	Ile	165	170	175	
Asp	Gln	Ala	Val	Asp	Leu	Ala	Glu	Lys	Gln	Ile	Ala	Leu	Leu	Lys	Glu	180	185	190	
His	Lys	Gln	Ile	Leu	Ile	Gln	Asn	Ala	Val	Thr	Arg	Gly	Leu	Asn	Pro	195	200	205	
Asp	Val	Pro	Leu	Lys	Asp	Ser	Gly	Val	Glu	Trp	Ile	Gly	Gln	Val	Pro	210	215	220	
Glu	His	Trp	Asp	Val	Gln	Arg	Ser	Lys	Phe	Ile	Phe	Lys	Lys	Ile	Glu	225	230	235	240
Arg	Lys	Val	Asn	Glu	Asp	Gln	Ile	Val	Thr	Cys	Phe	Arg	Asp	Gly		245	250	255	
Gln	Val	Thr	Leu	Arg	Ala	Asn	Arg	Arg	Thr	Glu	Gly	Phe	Thr	Asn	Ala	260	265	270	
Leu	Lys	Glu	His	Gly	Tyr	Gln	Gly	Ile	Arg	Lys	Gly	Asp	Leu	Val	Ile	275	280	285	
His	Ala	Met	Asp	Ala	Phe	Ala	Gly	Ala	Ile	Gly	Ile	Ser	Asp	Ser	Asp	290	295	300	
Gly	Lys	Ala	Thr	Pro	Val	Tyr	Ser	Val	Cys	Leu	Pro	His	Asp	Lys	Gln	305	310	315	320
Lys	Ile	Asp	Val	Tyr	Phe	Tyr	Ala	Tyr	Tyr	Leu	Arg	Asn	Leu	Ala	Leu	325	330	335	
Ser	Gly	Phe	Ile	Ser	Ser	Leu	Ala	Lys	Gly	Ile	Arg	Glu	Arg	Ser	Thr	340	345	350	
Asp	Phe	Arg	Tyr	Ser	Asp	Phe	Ala	Glu	Leu	Leu	Leu	Pro	Ile	Pro	Pro	355	360	365	
Tyr	Leu	Glu	Gln	Gln	Lys	Ile	Ala	Asp	Tyr	Leu	Asp	Lys	Gln	Thr	Ser	370	375	380	
Lys	Ile	Asp	Arg	Ala	Ile	Ala	Leu	Lys	Thr	Ala	His	Ile	Glu	Lys	Leu	385	390	395	400
Lys	Glu	Tyr	Lys	Ser	Val	Leu	Ile	Asn	Asp	Val	Val	Thr	Gly	Lys	Val	405	410	415	

Arg Val

<210> 25
<211> 3027
<212> DNA
<213> Haemophilus influenzae

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catcatgggtt ttaaactggc attttcacag gattttgatg cgcagtttgc catcgacaca 180
cgtctgtttt ggcaattcct gcaaaccagc caagaggcag aacttgcccg ttttcaacaa 240
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aacggcgtgt tgcacctgct gaaaaaaggc ttggatattg atagcgccca ttttgatttg 360
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gtgctgtttg ccaatggctt gccgattatt gcccttgagc tgaaaaacca ttggacaggt 540
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<210> 26
<211> 1008
<212> PRT
<213> Haemophilus influenzae
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Pro	Lys	Ala	Glu	Tyr	Leu	Pro	Arg	His	His	Gly	Phe	Lys	Leu	Ala	Phe
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Gln	Ile	Lys	Lys	Asn	Gly	Val	Leu	His	Leu	Leu	Lys	Lys	Gly	Leu	Asp
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Ile	Asp	Ser	Ala	His	Phe	Asp	Leu	Leu	Tyr	Pro	Val	Pro	Leu	Ala	Ser
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Ser	Gly	Glu	Lys	Val	Lys	Gln	Arg	Phe	Glu	Gln	Asn	Leu	Phe	Ser	Cys
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His	Trp	Thr	Gly	Gln	Thr	Ala	Ile	Asp	Ala	Gln	Lys	Gln	Tyr	Leu	Asn
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Glu	Ala	Tyr	Pro	Arg	Asn	Glu	Lys	Ala	Ala	Asn	Gly	Arg	Glu	Ala	Asp

Ser	Met	Ile	Asp	Val	Ala	Val	Gln	Arg	Phe	Asp	Asp	Glu	Leu	Glu	Leu	785	790	795	800
Asp	Leu	Asp	Arg	Asn	Glu	Lys	Val	Asp	Phe	Lys	Ile	Lys	Ala	Lys	Gln	805	810	815	
Phe	Leu	Lys	Ile	Tyr	Gly	Gln	Met	Ala	Ser	Ile	Ile	Asn	Phe	Glu	Asn	820	825	830	
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Leu	Lys	Val	Gln	Asp	Pro	Met	Asp	Glu	Phe	Asp	Glu	Ile	Leu	Asp	Ala	850	855	860	
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Ile	Lys	Leu	Asp	Asp	Glu	Glu	Thr	Glu	Leu	Asp	Pro	Gln	Asn	Pro	Asn	885	890	895	
Pro	Arg	Gly	Thr	His	Gly	Glu	Asp	Lys	Glu	Lys	Asp	Pro	Ile	Asp	Glu	900	905	910	
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Ser	His	Lys	Asp	Phe	Glu	Gln	Lys	Tyr	Gln	Asn	Asn	Pro	Asp	Ile	His	945	950	955	960
Thr	Arg	Glu	Leu	Ala	Phe	Gln	Ala	Ile	Leu	Arg	Asp	Val	Met	Ser	Glu	965	970	975	
Arg	His	Arg	Asp	Glu	Leu	Glu	Leu	Tyr	Lys	Leu	Phe	Ala	Lys	Asp	Ala	980	985	990	
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<210> 27
 <211> 2052
 <212> DNA
 <213> Haemophilus influenzae

<400> 27

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<210> 28
 <211> 683
 <212> PRT
 <213> Haemophilus influenzae

<400> 28

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Leu	Pro	Glu	Leu	Trp	Lys	Gln	Ala	Tyr	Glu	Asn	Leu	Ala	Thr	Leu	Ala
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Lys	Gln	Pro	Lys	Asn	Gln	Ile	Leu	Ser	Ala	Leu	Lys	Lys	Gly	Ser	Lys
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Leu	Asp	Ala	Tyr	Gly	Leu	Ile	Asp	Arg	Asp	Tyr	Arg	Pro	Asp	Ser	Val
			165						170					175	
His	Asp	Tyr	Leu	Asp	Trp	Gly	Glu	Thr	Leu	Asp	Phe	Asp	Glu	Phe	Val
		180						185					190		
Thr	Gln	Pro	Leu	Asn	Glu	Asn	Val	Leu	Leu	Lys	Ser	Cys	Thr	Glu	Val
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225					230					235					240
Arg	Lys	Gly	Val	Asn	Leu	Leu	Ile	Tyr	Gly	Val	Pro	Gly	Thr	Gly	Lys
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 <213> Haemophilus influenzae

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 <211> 324
 <212> PRT
 <213> Haemophilus influenzae

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 35 40 45
 His Lys Glu Cys Leu Asn Asn Gln Trp Asp Ser Cys Ile Glu Tyr Cys
 50 55 60
 Lys Thr Tyr Trp Ser Asp His Thr Gly Thr Val Ser Asn His Leu Arg
 65 70 75 80
 Gln Ile Gln Asp Phe Tyr Gln Leu Gly Glu Asp Thr Leu Trp Ile Thr
 85 90 95
 Phe Phe Gly Arg Lys Leu Tyr Trp Ala Phe Cys Ser Lys Glu Val Val
 100 105 110
 Glu Glu Ser Asp Gly Ser Arg Thr Arg Lys Val Ile Ser Asn Asn Gly
 115 120 125
 Asn Trp Ser Cys Val Asp Ala Asn Gly Lys Glu Leu Leu Val Asp Asn
 130 135 140
 Leu Asp Gly Arg Val Thr Lys Val Gln Ala Tyr Arg Gly Thr Ile Cys
 145 150 155 160
 Gly Val Glu Met Glu Asp Tyr Leu Ile Arg Arg Ile Asn Gly Glu Val
 165 170 175
 Ile Glu Glu Ile Thr Glu Ala Lys Glu Ala Tyr Glu Thr Leu Ile Lys
 180 185 190
 Ser Val Glu Lys Leu Ile Lys Gly Leu Trp Trp Ser Asp Phe Glu Leu
 195 200 205

Leu Thr Asp Leu Val Phe Ser Lys Leu Gly Trp Gln Arg Tyr Ser Val
 210 215 220
 Leu Gly Lys Thr Glu Lys Gly Ile Asp Leu Asp Leu Tyr Ser Ser Ser
 225 230 235 240
 Thr Gln Lys Arg Val Phe Val Gln Ile Lys Ser Asp Thr Asp Ile Lys
 245 250 255
 Gln Leu Asp Glu Tyr Val Ser Asn Phe Glu Ser Glu Tyr Lys Asn Tyr
 260 265 270
 Gly Tyr Ser Glu Met Tyr Tyr Val Tyr His Ser Gly Leu Glu Asn Ile
 275 280 285
 Asp Glu Lys Gln Tyr Gln Ala Lys Gly Ile Lys Leu Val Asn Gly Arg
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 Lys Met Ala Glu Leu Val Ile Ser Ala Gly Leu Val Glu Trp Leu Ile
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 <211> 744
 <212> DNA
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 <212> PRT
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 Glu Lys Arg Leu Glu Asn Arg Pro His Phe Ile Val Gly Val Ala Asp
 35 40 45
 Gly Ile Ser Asn Ser Asn Arg Pro Glu Lys Ala Ser Lys Leu Ala Met
 50 55 60
 Gln Leu Leu Ser Gln Met Glu Ser Ile Asn Arg Gln Thr Ile Tyr Asp
 65 70 75 80
 Leu Gln Ser Ser Leu Ser Ala Glu Leu Ala Glu Asp Tyr Phe Gly Ser
 85 90 95

Ala	Thr	Thr	Phe	Val	Ala	Ala	Glu	Ile	Asp	Gln	Ile	Thr	Arg	Lys	Ala	
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Lys	Ile	Leu	Ser	Val	Gly	Asp	Ser	Arg	Ala	Tyr	Leu	Ile	Asp	Ala	Gln	
		115					120					125				
Gly	Lys	Trp	Gln	Gln	Ile	Thr	Gln	Asp	His	Ser	Ile	Leu	Ser	Glu	Leu	
	130					135					140					
Leu	Thr	Asp	Phe	Pro	Asp	Lys	Lys	Glu	Glu	Asp	Phe	Ala	Thr	Ile	Tyr	
145					150					155					160	
Gly	Gly	Val	Ser	Ser	Cys	Leu	Val	Ala	Asp	Tyr	Ser	Glu	Phe	Gln	Asp	
			165						170					175		
Lys	Ile	Phe	Tyr	Gln	Glu	Ile	Glu	Ile	Gln	Gln	Gly	Glu	Ser	Leu	Leu	
		180						185					190			
Leu	Cys	Ser	Asp	Gly	Leu	Thr	Asp	Gly	Leu	Ser	Asp	Glu	Met	Arg	Glu	
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Lys	Ile	Trp	Gln	Lys	Tyr	Pro	Asp	Asp	Lys	Tyr	Arg	Leu	Thr	Val	Cys	
210						215					220					
Arg	Lys	Met	Ile	Glu	Lys	Gln	Ser	Phe	Ser	Asp	Asp	Leu	Ser	Val	Val	
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Cys	Cys	His	Ser	Ile	Ile	Glu										
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<210> 33
 <211> 816
 <212> DNA
 <213> Haemophilus influenzae

<400> 33																	
atgaaaaatg	atttgaatta	tgcagtggaa	cttatccgca	aagcggatgg	cattttaatt											60	
acagctggtg	cgggtatgag	cgtggattct	gggcttcccg	atttccgcag	cgttggcgga											120	
ttttggaatg	cttatcctat	gtttaaagaa	cataatatat	cttttgaaga	gacgcaacg											180	
ccactagctt	ataagcataa	tcaggaacta	gcctattggg	tttatgggca	tcgattagtt											240	
caataccgaa	atactcttcc	tcacgaaggg	tatcagattt	taaaatgctg	ggcggggagat											300	
aaacctcatg	gatattttgt	ttttaccagt	aatgttgatg	ggcattttca	aaaggctggt											360	
tttaagtata	gccatgttta	tgaagtacat	gggtactttg	agcgtcttca	atgtgtcaat											420	
aattgtcgag	gattaagttg	gtctgcatca	agttttcaac	ctgtcgtgga	taatgaaaac											480	
ttatgtttta	ccagtgaata	accacatttg	ccttattgtg	ggggctttgc	tcgtcaaaat											540	
gtactaatgt	ttaatgattg	gagttatgca	agtcaatatc	aggattttta	aaaagtgcgg											600	
ttagaatcgt	ggttaaaaga	agtgcaaaat	ctcgtcgtta	tcgaactggg	aacaggaaaa											660	
gccattccac	tgtgcgtcga	ttttctgaac	gtacggcgaa	aagcaaaaaa	aagggggggg											720	
ttatcccgtg	ttacccaca	agatgcaggg	cgtgcccgaa	aatgcacttt	tttaagtcta											780	
agaaatgaaa	gcgttagatg	cactaaaagc	gattga													816	

<210> 34
 <211> 271
 <212> PRT
 <213> Haemophilus influenzae

<400> 34																	
Met	Lys	Asn	Asp	Leu	Asn	Tyr	Ala	Val	Glu	Leu	Ile	Arg	Lys	Ala	Asp		
1				5					10					15			
Gly	Ile	Leu	Ile	Thr	Ala	Gly	Ala	Gly	Met	Ser	Val	Asp	Ser	Gly	Leu		
		20						25					30				
Pro	Asp	Phe	Arg	Ser	Val	Gly	Gly	Phe	Trp	Asn	Ala	Tyr	Pro	Met	Phe		
		35				40						45					
Lys	Glu	His	Asn	Ile	Ser	Phe	Glu	Glu	Ile	Ala	Thr	Pro	Leu	Ala	Tyr		

50		55		60
Lys His Asn Gln Glu Leu	Ala Tyr Trp Phe Tyr	Gly His Arg Leu Val		
65	70	75	80	
Gln Tyr Arg Asn Thr	Leu Pro His Glu Gly Tyr	Gln Ile Leu Lys Cys		
	85	90	95	
Trp Ala Gly Asp Lys	Pro His Gly Tyr Phe	Val Phe Thr Ser Asn Val		
	100	105	110	
Asp Gly His Phe Gln	Lys Ala Gly Phe Asn Asp	Ser His Val Tyr Glu		
	115	120	125	
Val His Gly Thr Leu	Glu Arg Leu Gln Cys Val	Asn Asn Cys Arg Gly		
	130	135	140	
Leu Ser Trp Ser Ala	Ser Ser Phe Gln Pro Val	Val Asp Asn Glu Asn		
145	150	155	160	
Leu Cys Leu Thr Ser	Glu Lys Pro His Leu Pro	Tyr Cys Gly Gly Phe		
	165	170	175	
Ala Arg Gln Asn Val	Leu Met Phe Asn Asp Trp	Ser Tyr Ala Ser Gln		
	180	185	190	
Tyr Gln Asp Phe Lys	Lys Val Arg Leu Glu Ser	Trp Leu Lys Glu Val		
	195	200	205	
Gln Asn Leu Val Val	Ile Glu Leu Gly Thr Gly	Lys Ala Ile Pro Leu		
	210	215	220	
Cys Val Asp Phe Leu	Asn Val Arg Arg Lys Ala	Lys Lys Arg Gly Gly		
225	230	235	240	
Leu Ser Arg Ile Thr	Pro Gln Asp Ala Gly Arg	Ala Arg Lys Cys Thr		
	245	250	255	
Phe Leu Ser Leu Arg	Asn Glu Ser Val Arg Cys	Thr Lys Ser Asp		
	260	265	270	

<210> 35
 <211> 273
 <212> DNA
 <213> Haemophilus influenzae

<400> 35	
tttctccata aagagaaatt ctttacttct tacatattta taaagccttt aattaagaaa	60
aaggagcaaa taatggcaat gaaagtaatt atggcaagag atccactttt tgaggatgta	120
aaaaaatatg tgcaacaaca aaaatttgca tcttgctcaa tgattcaacg cagatttatg	180
ttgggtttta atcgagctgg gcaaatttta gaacagttgg aacaagcggg tattatttca	240
tcaatgaaaa atgggcagag aaaagtatta tga	273

<210> 36
 <211> 90
 <212> PRT
 <213> Haemophilus influenzae

<400> 36	
Phe Leu His Lys Glu Lys Phe Phe Thr Ser Tyr Ile Phe Ile Lys Pro	
1 5 10 15	
Leu Ile Lys Lys Lys Glu Gln Ile Met Ala Met Lys Val Ile Met Ala	
20 25 30	
Arg Asp Pro Leu Phe Glu Asp Val Lys Lys Tyr Val Gln Gln Lys	
35 40 45	
Phe Ala Ser Cys Ser Met Ile Gln Arg Arg Phe Met Leu Gly Phe Asn	
50 55 60	
Arg Ala Gly Gln Ile Leu Glu Gln Leu Glu Gln Ala Gly Ile Ile Ser	

Thr Leu Glu Ser Gly Arg Gly Leu Val Asp Ile Val Ser Arg Tyr Thr
 165 170 175
 His Thr Phe Leu Trp Leu Gln Gln Tyr Asp Glu Gly Leu Leu Ala Glu
 180 185 190
 Pro Gln Thr Gln Gln Gly Gly Thr Leu Pro Thr Tyr Ala Glu Ala Phe
 195 200 205
 Ser Ala Leu Ala Glu Leu Lys Ser Gln Leu Met Thr Lys Gly Glu Ala
 210 215 220
 Ser Asp Leu Phe Gly Arg Glu Arg Asp Asn Gly Leu Ser Ala Ile Leu
 225 230 235 240
 Gly Asn Leu Asp Gln Ser Val Phe Gly Glu Pro Ala Tyr Pro Ser Ile
 245 250 255
 Glu Ala Lys Ala Ala His Leu Leu Tyr Phe Val Val Lys Asn His Pro
 260 265 270
 Phe Ser Asp Gly Asn Lys Arg Ser Gly Ala Phe Leu Phe Val Asp Phe
 275 280 285
 Leu His Arg Asn Gly Arg Leu Phe Asp His Asn Gly Tyr Pro Val Ile
 290 295 300
 Asn Asp Thr Gly Leu Ala Ala Leu Thr Leu Leu Val Ala Glu Ser Asp
 305 310 315 320
 Pro Lys Gln Lys Glu Thr Leu Ile Arg Leu Ile Met His Met Leu Lys
 325 330 335
 Gln Glu Lys Lys
 340

<210> 39
 <211> 711
 <212> DNA
 <213> Haemophilus influenzae

<400> 39
 atgacagaga aaaataaaacc aattttgcgtg gtattaacgg gagctggcat tagtgccgaa 60
 agtgggaattc caacttttag atcgggaagat ggtttgtggg cagggcataa agtagaagaa 120
 gtttgtacgc ccgaagcctt gcaaaagaac cgtgcgaaag tgcttgattt ctataaccaa 180
 cgccgtaaaa atgcggcagc agctaagcca aacgctgctc atctcgctt agttgaacta 240
 gaaaaagcct atgatgtgag aatcatcacg caaaatgtgg atgatttaca tgaacgtgcc 300
 ggcagctcga aggtgttgca ttacacaggt gaattaaata aagctcgag tagctttgat 360
 gaaagttata ttgtggattg ttttggatgat cagaaattag aagataaaga tccaaatgga 420
 cacccaatgc gcccttacat cgtctttttt ggtgaaatgg tgccgatgct agaacgagcg 480
 gttgatattg tggaacaagc agatgttggt ttagtgattg gcacttctt acaagtgtat 540
 ccagccaatg gcttagtcaa tgaagcccca agaaaagcgc caatttatct gattgatcct 600
 aacccaaata caggatttgt tcgtaagcaa gttattgcaa tcaaagaaaa agcaggcgag 660
 ggtgtgccaa aagtgggtgc agagttatta gagaacacca aaaactcata g 711

<210> 40
 <211> 236
 <212> PRT
 <213> Haemophilus influenzae

<400> 40
 Met Thr Glu Lys Asn Lys Pro Ile Cys Val Val Leu Thr Gly Ala Gly
 1 5 10 15
 Ile Ser Ala Glu Ser Gly Ile Pro Thr Phe Arg Ser Glu Asp Gly Leu
 20 25 30
 Trp Ala Gly His Lys Val Glu Glu Val Cys Thr Pro Glu Ala Leu Gln

Tyr	Val	Leu	Ser	Thr	Ala	Pro	Trp	His	Asn	Pro	Phe	Ala	Trp	Ser	Ile
65					70				75					80	
Lys	Val	Lys	Trp	Ile	His	His	Tyr	Phe	Gly	Glu	Glu	Lys	Gly	Ser	Ala
			85						90					95	
Leu	Tyr	Lys	Arg	Leu	Ile	Leu	Ser	His	His	Lys	Asn	Leu	Asn	Gln	Gly
			100					105					110		
Asp	Tyr	Leu	Ile	Asp	Asp	Arg	Thr	Lys	Asn	Gly	Ala	Gly	Lys	Phe	Gln
		115					120					125			
Gly	Glu	His	Val	His	Phe	Gly	Thr	Glu	Gln	Phe	Ala	Asn	Lys	Arg	Ser
	130					135					140				
Leu	Lys	Asn	Asp	Arg	Glu	Lys									
145					150										

<210> 43
 <211> 441
 <212> DNA
 <213> Haemophilus influenzae

<400> 43	
cattatcgga gtattcacgg taaagaacat aaggcacagg tcaagccctt ggcttttggtt	60
caacaaggac caagtagcta tttagtcgca caatatgaga atggcgatat ttacacctt	120
gctttgcatc gcttgcttaa ggtaacagtg agtacaatga tatttgaacg ccctgatttt	180
aatttgaaat cttatgtaga aagccaaaag tttggtttta cctatgggtcg aaaaattcga	240
ttaactttcc gcattaataa agatattggg ggatttttaa cagaaacacc attatcaatg	300
gatcaaacag taaaagattg tggcactgaa tatgaaattt ccgctaccgt gattaagagc	360
gctatgctgg aatgggtggat agcccatttt ggtgaagatt accaagaaat tgaccgcact	420
tatttagacg aaaatgccta a	441

<210> 44
 <211> 146
 <212> PRT
 <213> Haemophilus influenzae

<400> 44	
His Tyr Arg Ser Ile His Gly Lys Glu His Lys Ala Gln Val Lys Pro	
1 5 10 15	
Leu Ala Leu Val Gln Gln Gly Pro Ser Ser Tyr Leu Val Ala Gln Tyr	
20 25 30	
Glu Asn Gly Asp Ile Leu His Leu Ala Leu His Arg Leu Leu Lys Val	
35 40 45	
Thr Val Ser Thr Met Ile Phe Glu Arg Pro Asp Phe Asn Leu Lys Ser	
50 55 60	
Tyr Val Glu Ser Gln Lys Phe Gly Phe Thr Tyr Gly Arg Lys Ile Arg	
65 70 75 80	
Leu Thr Phe Arg Ile Asn Lys Asp Ile Gly Gly Phe Leu Thr Glu Thr	
85 90 95	
Pro Leu Ser Met Asp Gln Thr Val Lys Asp Cys Gly Thr Glu Tyr Glu	
100 105 110	
Ile Ser Ala Thr Val Ile Lys Ser Ala Met Leu Glu Trp Trp Ile Ala	
115 120 125	
His Phe Gly Glu Asp Tyr Gln Glu Ile Asp Arg Thr Tyr Leu Asp Glu	
130 135 140	
Asn Ala	
145	

<210> 45
 <211> 642
 <212> DNA
 <213> Haemophilus influenzae

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<400> 45
atgatgaact ggggtgcttgg gtcaatggag aaagcaccta gctttcagca ttatcatgga      60
catattgata atatcatcag aagtgtttat acgaatccaa tcttaagtat tgaattgtgc      120
aaatctgtaa cagaaggat ttgcaaaaca attctcaatg ataaaggaga aagtattcct      180
gaaaaatatc cgaatcttgt atctacaaca attaaaaaat tagatctgaa ttatcatcaa      240
gattaccaat atttgcttga attagctaaa agtctgggtt caattcttca ttatgttgca      300
aaaattagaa atgaatatgg tagttatgct tctcacggtc aagatattga acataagcaa      360
gtaagtagcg atcttgcttt atttgacttt cattcaacca atgcaatttt aggatttatt      420
ctacactttt acattgctac aaacgattat cgaaaaagtg aacgaatacg atatgaagat      480
tatgaaagaa tcaatgaatt aattgatgaa gaatatgaaa gggaagtaat atataaaatt      540
tcatattcac gggcattatt tgatcaagat ctagaagctt ataaagagtt agtacttaca      600
tttaacaaa cagaacatga gagtctgatg gatacgctct ga      642
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<210> 46
 <211> 213
 <212> PRT
 <213> Haemophilus influenzae

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<400> 46
Met Met Asn Trp Val Leu Gly Ser Met Glu Lys Ala Pro Ser Phe Gln
1      5      10      15
His Tyr His Gly His Ile Asp Asn Ile Ile Arg Ser Val Tyr Thr Asn
20     25     30
Pro Ile Leu Ser Ile Glu Leu Cys Lys Ser Val Thr Glu Gly Ile Cys
35     40     45
Lys Thr Ile Leu Asn Asp Lys Gly Glu Ser Ile Pro Glu Lys Tyr Pro
50     55     60
Asn Leu Val Ser Thr Thr Ile Lys Lys Leu Asp Leu Asn Tyr His Gln
65     70     75     80
Asp Tyr Gln Tyr Leu Leu Glu Leu Ala Lys Ser Leu Gly Ser Ile Leu
85     90     95
His Tyr Val Ala Lys Ile Arg Asn Glu Tyr Gly Ser Tyr Ala Ser His
100    105    110
Gly Gln Asp Ile Glu His Lys Gln Val Ser Ser Asp Leu Ala Leu Phe
115    120    125
Val Leu His Ser Thr Asn Ala Ile Leu Gly Phe Ile Leu His Phe Tyr
130    135    140
Ile Ala Thr Asn Asp Tyr Arg Lys Ser Glu Arg Ile Arg Tyr Glu Asp
145    150    155    160
Tyr Glu Arg Ile Asn Glu Leu Ile Asp Glu Glu Tyr Glu Arg Glu Val
165    170    175
Ile Tyr Lys Ile Ser Tyr Ser Arg Ala Leu Phe Asp Gln Asp Leu Glu
180    185    190
Ala Tyr Lys Glu Leu Val Leu Thr Phe Lys Gln Thr Glu His Glu Ser
195    200    205
Leu Met Asp Thr Leu
210
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<210> 47
 <211> 1344

<212> DNA
 <213> Haemophilus influenzae

<400> 47
 atgaatgatt ggaagggttat aacttttagct gattgcgctt catttcaaga aggttatggt 60
 aatccatcaa aaaatgaacc aagctacttt ggaggaacaa ttaaattggtt gagagcaaca 120
 gatttaaaca atggtttttgt atataaaacc tctcaaactt taacagaaaa aggattttta 180
 agtgcaaaaga agagtgctgt attatttgaa ccagatagtt tagcaattag caaatcagga 240
 actattggac gaattggaat cttaaaaagat tacatgtgtg gaaatagagc tgaattaat 300
 atcaaagtta atgaaaatat ttgtaaccca ttatttattt ttataacctt attaaatagc 360
 aaagaacaaa ttgaaacttt agctgaaggt agtgtccaaa aaaatctata tgtatcagct 420
 ttaagtaaag ttaaattatt acttctagat ataaataagc aaaaggaaat tggatatatt 480
 ctaaatactt tagatcaaaa aatagaactc aacactcaaa tcaaccaaac cttagaacaa 540
 atcgcccaag ccctgtttta aagctggttt gtcgatttcg atcccgtgcg tgccaaaatc 600
 caagcccttt cagacggtct tagccttgaa caagcagaac ttgccgccat gcaggcaatc 660
 agcggaaaaa caccggaaga actgaccgca ctttcacaaa cacagcctga ccgctacgcc 720
 gaactagccg aaaccgcca agcgtttccg tgtgagatgg tggaggttga tggggttgaa 780
 gtgccgaagg ggtgggaatt atctacgatt ggcgattgtt atgatgtcgt tatggggcaa 840
 tctccaaaag gagaaactta taatgaaaac aaacaaggga tgcttttcta tcaaggctcg 900
 gcagaatttg gttggcgctt tctacccca agattattta caacagatcc taaacgtatt 960
 gcagaacaaa attctatttt aatgagcgtt cgagctcctg ttggggacat taatatagca 1020
 cttgaaaaat gctgtattgg tcgcggatta gctgcattac aacataagag taaaagtttg 1080
 tcgttcggtt tatatcaaat acaatctata aaaccagaat tagatttatt taatggtgaa 1140
 ggaactgttt ttggttctat caatcaggat aacttaaaaa atatccaat tattaaccct 1200
 gatgaaaaat ttattcagct ttttgaaaaa tatttatcat cttgtgattc aaaaattatg 1260
 aataacgaga tagaaaataa tgcactgaaa gaaataaggg atttattggtt acctagatta 1320
 ttgagtgagg aaattcaatt atga 1344

<210> 48
 <211> 447
 <212> PRT
 <213> Haemophilus influenzae

<400> 48
 Met Asn Asp Trp Lys Val Ile Thr Leu Ala Asp Cys Ala Ser Phe Gln
 1 5 10 15
 Glu Gly Tyr Val Asn Pro Ser Lys Asn Glu Pro Ser Tyr Phe Gly Gly
 20 25 30
 Thr Ile Lys Trp Leu Arg Ala Thr Asp Leu Asn Asn Gly Phe Val Tyr
 35 40 45
 Lys Thr Ser Gln Thr Leu Thr Glu Lys Gly Phe Leu Ser Ala Lys Lys
 50 55 60
 Ser Ala Val Leu Phe Glu Pro Asp Ser Leu Ala Ile Ser Lys Ser Gly
 65 70 75 80
 Thr Ile Gly Arg Ile Gly Ile Leu Lys Asp Tyr Met Cys Gly Asn Arg
 85 90 95
 Ala Val Ile Asn Ile Lys Val Asn Glu Asn Ile Cys Asn Pro Leu Phe
 100 105 110
 Ile Phe Tyr Thr Leu Leu Asn Ser Lys Glu Gln Ile Glu Thr Leu Ala
 115 120 125
 Glu Gly Ser Val Gln Lys Asn Leu Tyr Val Ser Ala Leu Ser Lys Val
 130 135 140
 Lys Leu Leu Leu Leu Asp Ile Asn Lys Gln Lys Glu Ile Gly Tyr Ile
 145 150 155 160
 Leu Asn Thr Leu Asp Gln Lys Ile Glu Leu Asn Thr Gln Ile Asn Gln

				165					170					175			
Thr	Leu	Glu	Gln	Ile	Ala	Gln	Ala	Leu	Phe	Lys	Ser	Trp	Phe	Val	Asp		
			180					185					190				
Phe	Asp	Pro	Val	Arg	Ala	Lys	Ile	Gln	Ala	Leu	Ser	Asp	Gly	Leu	Ser		
		195					200					205					
Leu	Glu	Gln	Ala	Glu	Leu	Ala	Ala	Met	Gln	Ala	Ile	Ser	Gly	Lys	Thr		
	210					215					220						
Pro	Glu	Glu	Leu	Thr	Ala	Leu	Ser	Gln	Thr	Gln	Pro	Asp	Arg	Tyr	Ala		
225					230					235					240		
Glu	Leu	Ala	Glu	Thr	Ala	Lys	Ala	Phe	Pro	Cys	Glu	Met	Val	Glu	Val		
			245					250						255			
Asp	Gly	Val	Glu	Val	Pro	Lys	Gly	Trp	Glu	Leu	Ser	Thr	Ile	Gly	Asp		
		260						265					270				
Cys	Tyr	Asp	Val	Val	Met	Gly	Gln	Ser	Pro	Lys	Gly	Glu	Thr	Tyr	Asn		
	275					280					285						
Glu	Asn	Lys	Gln	Gly	Met	Leu	Phe	Tyr	Gln	Gly	Arg	Ala	Glu	Phe	Gly		
290						295					300						
Trp	Arg	Phe	Pro	Thr	Pro	Arg	Leu	Phe	Thr	Thr	Asp	Pro	Lys	Arg	Ile		
305					310					315					320		
Ala	Glu	Gln	Asn	Ser	Ile	Leu	Met	Ser	Val	Arg	Ala	Pro	Val	Gly	Asp		
			325					330						335			
Ile	Asn	Ile	Ala	Leu	Glu	Lys	Cys	Cys	Ile	Gly	Arg	Gly	Leu	Ala	Ala		
		340						345					350				
Leu	Gln	His	Lys	Ser	Lys	Ser	Leu	Ser	Phe	Gly	Leu	Tyr	Gln	Ile	Gln		
		355					360					365					
Ser	Ile	Lys	Pro	Glu	Leu	Asp	Leu	Phe	Asn	Gly	Glu	Gly	Thr	Val	Phe		
	370					375					380						
Gly	Ser	Ile	Asn	Gln	Asp	Asn	Leu	Lys	Asn	Ile	Gln	Ile	Ile	Asn	Pro		
385					390					395					400		
Asp	Glu	Lys	Phe	Ile	Gln	Leu	Phe	Glu	Lys	Tyr	Leu	Ser	Ser	Cys	Asp		
			405					410						415			
Ser	Lys	Ile	Met	Asn	Asn	Glu	Ile	Glu	Asn	Asn	Ala	Leu	Lys	Glu	Ile		
		420						425					430				
Arg	Asp	Leu	Leu	Leu	Pro	Arg	Leu	Leu	Ser	Gly	Glu	Ile	Gln	Leu			
	435						440						445				

<210> 49

<211> 1995

<212> DNA

<213> Haemophilus influenzae

<400> 49

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gtgggattat	gtggagaatg	gggaaatggt	aaaacatcct	atataaat	aatgcgacca	180
gaattagaaa	aaaattcttt	tgtacttgat	tttaatcctt	ggatgttttag	tgatgctcat	240
aacttagttg	ctttatTTTT	tactgaaatc	tctgctcagt	taagagatta	tgaggatgat	300
aatgagctaa	ttgatagttt	gagtagtttt	ggagagttgt	tatctaattt	aaaacctatt	360
ccatttgtag	gaaattatTT	tagtgtcttg	ggtggctgtt	taagtttttt	ttcaaagaaa	420
aagaaagaaa	aaaacagttt	gaaaaatcaa	cgtgataaat	taattaaagt	tctaaaggaa	480
ataagtaaac	ctattactgt	aatttttagat	gatatagacc	gtttatcatc	tgatgaatta	540
caatcaattc	taaaattggt	cagagttaca	ggaaactttc	ctaataattgt	ttatgtttta	600
tcatttgata	aaaatagagt	aattaaacca	ttaaatagata	ataccattga	tggccaggat	660
tatttagaga	agataattca	gattccattc	gatataccac	aggtaccta	aaaactatta	720
caagaaaatt	tattttcatc	tttagataag	attttaaggg	atgtttacct	agataaggcg	780

cgttggtcta	atgcatattg	gaatatcatt	aagccaacaa	taaaaaatat	tcgagatatt	840
aagcgttaca	catcttctct	atcgaatatc	tttaaacaat	taggtaaaga	aattgatgtg	900
gttgatttac	tcactattga	agcgataaga	attttctttc	cagataaatt	taaagaaatt	960
tttgaactta	aagattatct	cttggcacga	tcagataatg	acaaaagaaa	agttaagtta	1020
agtgatttta	ttcaagataa	tgaaatgtat	gagtcctttc	tagaagtttt	atttgatatt	1080
gataatataa	attcaaataa	tgaattccta	aaaaatagaa	ggattgctta	ttcggcattc	1140
tttgatttat	attttgaaca	agttatgagt	cctgagttca	taaatgttaa	attatcacaa	1200
aaagtttggc	ttgcaatgca	gtcagaagaa	gattttcaaga	tcgctttatc	agctgttcct	1260
gacgattctc	tagaaaatgt	agttaacaat	ttaattgact	atgaaaaaga	ctttactaaa	1320
gaaatagctc	tagcaactat	accaacatta	tatagaaatt	taccaagagt	gcctgaaaaa	1380
gaattaggat	tccttgactt	tggggcggat	atggtttggg	gtcgcttagt	ttatagatta	1440
cttagaagac	ttcctgagaa	ggataaaaaa	gaagttatta	ctcaactatt	aaattctagc	1500
gatctatatg	ggcaatatca	aattgttaga	attattggat	atcgagaggg	ccgagggtcat	1560
caattagtat	ctgaatcgga	tgcaaaaagac	ttggaggaaa	tattttttaa	taatattcgc	1620
tctgcaacaa	ttaaagaact	tgcaggaacc	tataatttgt	cacatataat	ctatttcttt	1680
gtttcaattg	gaaacccttt	ttctgatgat	atattaagtt	cccctgaagt	atttttatca	1740
ttactttaa	cttcaatata	agaacgtaaa	tctcaaagag	gggatgatcc	tacaatacat	1800
agagagaaaa	ttctactttg	ggatgcctta	attaaaaatt	gtggagatga	ggataaagta	1860
aatagtttaa	ttgaaaaaat	agctgaagat	gaagaactta	gaaataaaga	ttatatggaa	1920
cttgcaatta	aatataagaa	tggataccga	cataaaaaat	caatgaatca	tgaagatgat	1980
ttagatgagt	tttaa					1995

<210> 50

<211> 664

<212> PRT

<213> Haemophilus influenzae

<400> 50

Met	Glu	Leu	Ile	Ser	Asp	Asn	Pro	Ile	Lys	Asp	Ser	Ser	Asn	Asp	Leu
1				5					10					15	
Leu	Gly	Arg	Ala	Ser	Ser	Ala	Glu	Ala	Phe	Ala	Lys	His	Ile	Phe	Ser
			20					25					30		
Phe	Asp	Tyr	Lys	Glu	Gly	Leu	Val	Gly	Leu	Cys	Gly	Glu	Trp	Gly	
		35				40					45				
Asn	Gly	Lys	Thr	Ser	Tyr	Ile	Asn	Leu	Met	Arg	Pro	Glu	Leu	Glu	Lys
	50					55				60					
Asn	Ser	Phe	Val	Leu	Asp	Phe	Asn	Pro	Trp	Met	Phe	Ser	Asp	Ala	His
	65				70				75					80	
Asn	Leu	Val	Ala	Leu	Phe	Phe	Thr	Glu	Ile	Ser	Ala	Gln	Leu	Arg	Asp
			85					90					95		
Tyr	Glu	Asp	Asp	Asn	Glu	Leu	Ile	Asp	Ser	Leu	Ser	Ser	Phe	Gly	Glu
		100						105					110		
Leu	Leu	Ser	Asn	Leu	Lys	Pro	Ile	Pro	Phe	Val	Gly	Asn	Tyr	Phe	Ser
		115				120						125			
Val	Leu	Gly	Gly	Cys	Leu	Ser	Phe	Phe	Ser	Lys	Lys	Lys	Lys	Glu	Lys
	130					135					140				
Asn	Ser	Leu	Lys	Asn	Gln	Arg	Asp	Lys	Leu	Ile	Lys	Val	Leu	Lys	Glu
	145				150				155					160	
Ile	Ser	Lys	Pro	Ile	Thr	Val	Ile	Leu	Asp	Asp	Ile	Asp	Arg	Leu	Ser
			165					170					175		
Ser	Asp	Glu	Leu	Gln	Ser	Ile	Leu	Lys	Leu	Val	Arg	Val	Thr	Gly	Asn
		180						185					190		
Phe	Pro	Asn	Ile	Val	Tyr	Val	Leu	Ser	Phe	Asp	Lys	Asn	Arg	Val	Ile
		195				200					205				
Lys	Pro	Leu	Asn	Asp	Asn	Thr	Ile	Asp	Gly	Gln	Asp	Tyr	Leu	Glu	Lys

210	215	220
Ile Ile Gln Ile Pro Phe Asp Ile Pro Gln Val Pro Lys Lys Leu Leu		
225	230	235
Gln Glu Asn Leu Phe Ser Ser Leu Asp Lys Ile Leu Arg Asp Val Tyr		
	245	250
Leu Asp Lys Ala Arg Trp Ser Asn Ala Tyr Trp Asn Ile Ile Lys Pro		
	260	265
Thr Ile Lys Asn Ile Arg Asp Ile Lys Arg Tyr Thr Ser Ser Leu Ser		
	275	280
Asn Ile Phe Lys Gln Leu Gly Lys Glu Ile Asp Val Val Asp Leu Leu		
	290	295
Thr Ile Glu Ala Ile Arg Ile Phe Phe Pro Asp Lys Phe Lys Glu Ile		
305	310	315
Phe Glu Leu Lys Asp Tyr Leu Leu Ala Arg Ser Asp Asn Asp Lys Arg		
	325	330
Lys Val Lys Leu Ser Asp Phe Ile Gln Asp Asn Glu Met Tyr Glu Ser		
	340	345
Phe Leu Glu Val Leu Phe Asp Ile Asp Asn Ile Asn Ser Asn Asn Glu		
	355	360
Phe Leu Lys Asn Arg Arg Ile Ala Tyr Ser Ala Phe Phe Asp Leu Tyr		
370	375	380
Phe Glu Gln Val Met Ser Pro Glu Phe Ile Asn Val Lys Leu Ser Gln		
385	390	395
Lys Val Trp Leu Ala Met Gln Ser Glu Glu Asp Phe Lys Ile Ala Leu		
	405	410
Ser Ala Val Pro Asp Asp Ser Leu Glu Asn Val Val Asn Asn Leu Ile		
	420	425
Asp Tyr Glu Lys Asp Phe Thr Lys Glu Ile Ala Leu Ala Thr Ile Pro		
	435	440
Thr Leu Tyr Arg Asn Leu Pro Arg Val Pro Glu Lys Glu Leu Gly Phe		
	450	455
Phe Asp Phe Gly Ala Asp Met Val Trp Ser Arg Leu Val Tyr Arg Leu		
465	470	475
Leu Arg Arg Leu Pro Glu Lys Asp Lys Lys Glu Val Ile Thr Gln Leu		
	485	490
Leu Asn Ser Ser Asp Leu Tyr Gly Gln Tyr Gln Ile Val Gly Ile Ile		
	500	505
Gly Tyr Arg Glu Gly Arg Gly His Gln Leu Val Ser Glu Ser Asp Ala		
	515	520
Lys Asp Leu Glu Glu Ile Phe Leu Asn Asn Ile Arg Ser Ala Thr Ile		
	530	535
Lys Glu Leu Ala Gly Thr Tyr Asn Leu Ser His Ile Ile Tyr Phe Phe		
545	550	555
Val Ser Ile Gly Asn Pro Phe Ser Asp Asp Ile Leu Ser Ser Pro Glu		
	565	570
Val Phe Leu Ser Leu Leu Lys Ser Ser Ile Ser Glu Arg Lys Ser Gln		
	580	585
Arg Gly Asp Asp Pro Thr Ile His Arg Glu Lys Ile Leu Leu Trp Asp		
	595	600
Ala Leu Ile Lys Ile Cys Gly Asp Glu Asp Lys Val Asn Ser Leu Ile		
	610	615
Glu Lys Ile Ala Glu Asp Glu Glu Leu Arg Asn Lys Asp Tyr Met Glu		
625	630	635
Leu Ala Ile Lys Tyr Lys Asn Gly Tyr Arg His Lys Lys Ser Met Asn		
	645	650
		655

His Glu Asp Asp Leu Asp Glu Phe
660

<210> 51
<211> 1155
<212> DNA
<213> Haemophilus influenzae

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<400> 51
tatgacaaaa gtttagacaa aattgcaaaa caattaagag attctgataa aaagggttaat      60
ctaatttacg cctttaatgg aagtggaaaa acccgtttat caaaagtctt taagaatctt      120
attgcaccta aagaaaatca tgacaatgaa gaagatctaa cacgaagaaa aattctttat      180
ttcaatgcct ttaccgaaga tttattctat tgggataatg atctacttaa tgacacagaa      240
ccaaaattaa agattcaacc aaattctttt attcgctggg tgattagaga tcaaggggat      300
gaaggtaaag taattggaaa atttcatcat tattgtgatg aaaaacttat gcctaaattt      360
gatatagaaa ataatacaat tacattcagt tttgcacgtg gagatgatac gcctgaagaa      420
aatataaaac tatcgaaggg ggaagaaagt aattttatgt ggagtatttt tcatacgtta      480
attgaacaag ttgttgcaga attaaatatc tcagagccta gtgaacgcac tactaatgaa      540
tttgatgaac ttaaataatat ctttattgat gatccagtaa gttcattgga tgaaaatcat      600
cttattcaat tagctgttga tttagcagaa ttagtcaaag atagtcocga tactataaaa      660
tttattatca ccacacacaa tcctttatgt tataacgttt tataacaatga acttggagca      720
aaaaatgggt atattctaag aaaagatgaa aataagaatg aaaaagaaag atttgatctt      780
gaggtgaaac aaggtgggtc aaacaagagt ttctcctatc atctttttct aaaaaatcta      840
cttgaagaag ttgaacctaa agatattcaa aaatatcact tcatgttact gagaaattta      900
tatgaaaaag ctgctaactt tcttggttat tcaggatggg caaatctatt acccaatgat      960
gatgcaagac aaagctatta cactcgtata atcaatttta ctagtcactc tacgttatca     1020
aatgagataa tcgctgagcc aacagatgcc gaaaagaaga ttgttaaata tttacttgaa     1080
catctaatta ataattatgg tttctatata gaagaaaata ttaaagacct acaaactgat     1140
aatataacag agtaa                                     1155
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<210> 52
<211> 384
<212> PRT
<213> Haemophilus influenzae

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<400> 52
Tyr Asp Lys Ser Leu Asp Lys Ile Ala Lys Gln Leu Arg Asp Ser Asp
 1          5          10          15
Lys Lys Val Asn Leu Ile Tyr Ala Phe Asn Gly Ser Gly Lys Thr Arg
 20          25          30
Leu Ser Lys Val Phe Lys Asn Leu Ile Ala Pro Lys Glu Asn His Asp
 35          40          45
Asn Glu Glu Asp Leu Thr Arg Arg Lys Ile Leu Tyr Phe Asn Ala Phe
 50          55          60
Thr Glu Asp Leu Phe Tyr Trp Asp Asn Asp Leu Leu Asn Asp Thr Glu
 65          70          75          80
Pro Lys Leu Lys Ile Gln Pro Asn Ser Phe Ile Arg Trp Leu Ile Arg
 85          90          95
Asp Gln Gly Asp Glu Gly Lys Val Ile Gly Lys Phe His His Tyr Cys
100          105          110
Asp Glu Lys Leu Met Pro Lys Phe Asp Ile Glu Asn Asn Gln Ile Thr
115          120          125
Phe Ser Phe Ala Arg Gly Asp Asp Thr Pro Glu Glu Asn Ile Lys Leu
130          135          140
Ser Lys Gly Glu Glu Ser Asn Phe Ile Trp Ser Ile Phe His Thr Leu
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145					150					155					160
Ile	Glu	Gln	Val	Val	Ala	Glu	Leu	Asn	Ile	Ser	Glu	Pro	Ser	Glu	Arg
				165					170					175	
Thr	Thr	Asn	Glu	Phe	Asp	Glu	Leu	Lys	Tyr	Ile	Phe	Ile	Asp	Asp	Pro
			180					185					190		
Val	Ser	Ser	Leu	Asp	Glu	Asn	His	Leu	Ile	Gln	Leu	Ala	Val	Asp	Leu
		195				200					205				
Ala	Glu	Leu	Val	Lys	Asp	Ser	Pro	Asp	Thr	Ile	Lys	Phe	Ile	Ile	Thr
	210				215						220				
Thr	His	Asn	Pro	Leu	Phe	Tyr	Asn	Val	Leu	Tyr	Asn	Glu	Leu	Gly	Ala
	225				230					235					240
Lys	Asn	Gly	Tyr	Ile	Leu	Arg	Lys	Asp	Glu	Asn	Lys	Asn	Glu	Lys	Glu
				245					250					255	
Arg	Phe	Asp	Leu	Glu	Val	Lys	Gln	Gly	Gly	Ser	Asn	Lys	Ser	Phe	Ser
		260						265					270		
Tyr	His	Leu	Phe	Leu	Lys	Asn	Leu	Leu	Glu	Glu	Val	Glu	Pro	Lys	Asp
		275				280						285			
Ile	Gln	Lys	Tyr	His	Phe	Met	Leu	Leu	Arg	Asn	Leu	Tyr	Glu	Lys	Ala
	290					295					300				
Ala	Asn	Phe	Leu	Gly	Tyr	Ser	Gly	Trp	Ser	Asn	Leu	Leu	Pro	Asn	Asp
	305				310					315					320
Asp	Ala	Arg	Gln	Ser	Tyr	Tyr	Thr	Arg	Ile	Ile	Asn	Phe	Thr	Ser	His
			325						330					335	
Ser	Thr	Leu	Ser	Asn	Glu	Ile	Ile	Ala	Glu	Pro	Thr	Asp	Ala	Glu	Lys
			340					345					350		
Lys	Ile	Val	Lys	Tyr	Leu	Leu	Glu	His	Leu	Ile	Asn	Asn	Tyr	Gly	Phe
	355					360					365				
Tyr	Ile	Glu	Glu	Asn	Ile	Lys	Asp	Pro	Gln	Thr	Asp	Asn	Ile	Thr	Glu
	370				375						380				

<210> 53
 <211> 999
 <212> DNA
 <213> Haemophilus influenzae

<400> 53	
atgaacgact taatcatcta caacactgac gatggtaa	ctcacgttgc tttattagtt 60
atcgaaaatg aggccttggct gactcaaaat cagcttgc	aacttttttga cacctctgta 120
ccaaatataa ccactcatat aaaaaacata ttacaagaca	aagagttaga tgagttttca 180
gttattaagg attacttaat aactgcccaa gatagcaa	aatatcaagt aaaacattat 240
tcccttgata tgattctcgc catcggccttt cgtgtgcg	gccctcgtgg tgtacagttt 300
cgtcgttggg cgaatacgca attacgtact tathtagata	aagggttttct attagataaa 360
gagcggttga aaaatcctca aggtcgtatt gatcattttg	atgaattact ggaacaaatt 420
cgcgaaattc gagccagtga attgcggttt tatcaaaaag	tacgagagtt atttaaatta 480
tccagtgact acgataaaac agataaaagtc actcaaatgt	tttttgcaga aacacaaaat 540
aagttgattt atgccattac acaacaaacc gccgcagagc	ttatttgtac gcgtgcaaat 600
gccaaattgc ctaatatggg tcttacctct tggaaagg	ctgttgtacg taaaggcgat 660
attattaccg ctaaaaacta tttaactcat gatgaattag	attctttgaa tcgttttagtg 720
atgatctttt tagaaagtgc tgaattacgc gttaaaaatc	gtcaagatct cacattaaat 780
ttctggcgta ataatgtcga taatttaatt gaatttaacg	gttttccggt gcttatcgggt 840
aatggaaccc gaaccgtaaa acaaatggaa acctttacca	aagaacaata tgccttattt 900
gatcaggtca gaaaacaaca aaaacgcata caagctgata	atgaagattt agaaatttta 960
gaaaactggc agaaagatct gaaaaagcaa aagcattaa	999

<210> 54

<211> 332
 <212> PRT
 <213> Haemophilus influenzae

<400> 54
 Met Asn Asp Leu Ile Ile Tyr Asn Thr Asp Asp Gly Lys Ser His Val
 1 5 10 15
 Ala Leu Leu Val Ile Glu Asn Glu Ala Trp Leu Thr Gln Asn Gln Leu
 20 25 30
 Ala Glu Leu Phe Asp Thr Ser Val Pro Asn Ile Thr Thr His Ile Lys
 35 40 45
 Asn Ile Leu Gln Asp Lys Glu Leu Asp Glu Phe Ser Val Ile Lys Asp
 50 55 60
 Tyr Leu Ile Thr Ala Gln Asp Ser Lys Gln Tyr Gln Val Lys His Tyr
 65 70 75 80
 Ser Leu Asp Met Ile Leu Ala Ile Gly Phe Arg Val Arg Ser Pro Arg
 85 90 95
 Gly Val Gln Phe Arg Arg Trp Ala Asn Thr Gln Leu Arg Thr Tyr Leu
 100 105 110
 Asp Lys Gly Phe Leu Leu Asp Lys Glu Arg Leu Lys Asn Pro Gln Gly
 115 120 125
 Arg Phe Asp His Phe Asp Glu Leu Leu Glu Gln Ile Arg Glu Ile Arg
 130 135 140
 Ala Ser Glu Leu Arg Phe Tyr Gln Lys Val Arg Glu Leu Phe Lys Leu
 145 150 155 160
 Ser Ser Asp Tyr Asp Lys Thr Asp Lys Val Thr Gln Met Phe Phe Ala
 165 170 175
 Glu Thr Gln Asn Lys Leu Ile Tyr Ala Ile Thr Gln Gln Thr Ala Ala
 180 185 190
 Glu Leu Ile Cys Thr Arg Ala Asn Ala Lys Leu Pro Asn Met Gly Leu
 195 200 205
 Thr Ser Trp Lys Gly Ala Val Val Arg Lys Gly Asp Ile Ile Thr Ala
 210 215 220
 Lys Asn Tyr Leu Thr His Asp Glu Leu Asp Ser Leu Asn Arg Leu Val
 225 230 235 240
 Met Ile Phe Leu Glu Ser Ala Glu Leu Arg Val Lys Asn Arg Gln Asp
 245 250 255
 Leu Thr Leu Asn Phe Trp Arg Asn Asn Val Asp Asn Leu Ile Glu Phe
 260 265 270
 Asn Gly Phe Pro Leu Leu Ile Gly Asn Gly Thr Arg Thr Val Lys Gln
 275 280 285
 Met Glu Thr Phe Thr Lys Glu Gln Tyr Ala Leu Phe Asp Gln Val Arg
 290 295 300
 Lys Gln Gln Lys Arg Ile Gln Ala Asp Asn Glu Asp Leu Glu Ile Leu
 305 310 315 320
 Glu Asn Trp Gln Lys Asp Leu Lys Lys Gln Lys His
 325 330

<210> 55
 <211> 819
 <212> DNA
 <213> Haemophilus influenzae

<400> 55
 atgcaacagc gtgtactttt tttaaaagcg tggctaagcc aacgttatac taaaactgaa

60

ctgtgtcagc	agtttaatat	tagccgtcca	acggcagata	aatggattaa	acgccacgaa	120
cagcttggtt	ttgagggctt	aagcgagtta	tctcgtaa	attatcatag	ccctaatagcc	180
acgccacaat	ggatttgtga	ctggcttatc	agtgagaaac	ttaaactgcc	tactgggggt	240
gccaaaaagc	ttttagataa	ctttactcgg	cattttccag	aagcgaaaaa	gccgtctgat	300
agcacgggcg	atttaatttt	ggcgtgtgca	gggttaaaac	gtcgtatgag	tgcagacaca	360
caatcttttg	gcgaatgcat	cgcacccaat	accacctgga	gtgctgactt	caaggggcaa	420
tttttactcg	gcaatcagaa	gttctgctat	ccgctgacga	ttacagataa	tttcagtcgc	480
tttttatttt	gttgtaaggg	gttgccgaat	acaaaatcag	cgctgttat	tgctgagttt	540
gaacgtcttt	ttgagcaatt	tggctgccg	tattcgattc	gtaccgataa	cgattcatct	600
tttgcatacac	aagcattagg	tggatctagg	tgtattgact	taggtattcc	ttctgaacga	660
attaagccat	cacacccaga	gcagaacgga	cgacacgagc	gaatgcaccg	tagcttaaaa	720
acagcgcttc	aacctcaaaa	tagctttgaa	gctcaacaga	cattcttcaa	ccaattctta	780
cgagaataca	aagaagaatg	ttcacacgaa	ggcgtttga			819

<210> 56
 <211> 272
 <212> PRT
 <213> Haemophilus influenzae

<400> 56

Met	Gln	Gln	Arg	Val	Leu	Phe	Leu	Lys	Ala	Trp	Leu	Ser	Gln	Arg	Tyr
1				5					10					15	
Thr	Lys	Thr	Glu	Leu	Cys	Gln	Gln	Phe	Asn	Ile	Ser	Arg	Pro	Thr	Ala
			20					25					30		
Asp	Lys	Trp	Ile	Lys	Arg	His	Glu	Gln	Leu	Gly	Phe	Glu	Gly	Leu	Ser
		35				40					45				
Glu	Leu	Ser	Arg	Lys	Ser	Tyr	His	Ser	Pro	Asn	Ala	Thr	Pro	Gln	Trp
	50				55					60					
Ile	Cys	Asp	Trp	Leu	Ile	Ser	Glu	Lys	Leu	Lys	Arg	Pro	His	Trp	Gly
65				70				75						80	
Ala	Lys	Lys	Leu	Leu	Asp	Asn	Phe	Thr	Arg	His	Phe	Pro	Glu	Ala	Lys
			85					90					95		
Lys	Pro	Ser	Asp	Ser	Thr	Gly	Asp	Leu	Ile	Leu	Ala	Cys	Ala	Gly	Leu
			100					105					110		
Lys	Arg	Arg	Met	Ser	Ala	Asp	Thr	Gln	Ser	Phe	Gly	Glu	Cys	Ile	Ala
		115				120						125			
Pro	Asn	Thr	Thr	Trp	Ser	Ala	Asp	Phe	Lys	Gly	Gln	Phe	Leu	Leu	Gly
	130				135						140				
Asn	Gln	Lys	Phe	Cys	Tyr	Pro	Leu	Thr	Ile	Thr	Asp	Asn	Phe	Ser	Arg
145				150					155					160	
Phe	Leu	Phe	Cys	Cys	Lys	Gly	Leu	Pro	Asn	Thr	Lys	Ser	Ala	Pro	Val
			165					170					175		
Ile	Ala	Glu	Phe	Glu	Arg	Leu	Phe	Glu	Gln	Phe	Gly	Leu	Pro	Tyr	Ser
		180					185					190			
Ile	Arg	Thr	Asp	Asn	Asp	Ser	Ser	Phe	Ala	Ser	Gln	Ala	Leu	Gly	Gly
	195					200						205			
Ser	Arg	Cys	Ile	Asp	Leu	Gly	Ile	Pro	Ser	Glu	Arg	Ile	Lys	Pro	Ser
	210				215						220				
His	Pro	Glu	Gln	Asn	Gly	Arg	His	Glu	Arg	Met	His	Arg	Ser	Leu	Lys
225				230				235						240	
Thr	Ala	Leu	Gln	Pro	Gln	Asn	Ser	Phe	Glu	Ala	Gln	Gln	Thr	Phe	Phe
			245					250					255		
Asn	Gln	Phe	Leu	Arg	Glu	Tyr	Lys	Glu	Glu	Cys	Ser	His	Glu	Gly	Val
			260					265					270		

<210> 57
 <211> 333
 <212> DNA
 <213> Haemophilus influenzae

<400> 57
 tgccaaacgg cgaacaaatc cgcagaatta agcagcgttg tggctattct cgcttcatgt 60
 ttaatcgggt taacttggca gaatgaacaa tataagcaag ataatggcgt caagttcagt 120
 tatacgaaaa tcgccaaatt gcaccacaaa gtcaccaata cccacaaaaa aaactacttg 180
 catcaaattc cacaccgaat cagcaaaaac cacgcaatga tttatattga gagtttgcaa 240
 gcaacaaatt accaaggaga tgcggaaaat acagtataaac gcgaaacaaa aatcagactt 300
 aaaccgttca acttcagcac aatcttggca tga 333

<210> 58
 <211> 110
 <212> PRT
 <213> Haemophilus influenzae

<400> 58
 Cys Gln Thr Ala Asn Lys Ser Ala Glu Leu Ser Ser Val Val Ala Ile
 1 5 10 15
 Leu Ala Ser Cys Leu Ile Gly Leu Thr Trp Gln Asn Glu Gln Tyr Lys
 20 25 30
 Gln Asp Asn Gly Val Lys Phe Ser Tyr Thr Lys Ile Ala Lys Leu His
 35 40 45
 His Lys Val Thr Asn Thr His Lys Lys Asn Tyr Leu His Gln Ile Pro
 50 55 60
 His Arg Ile Ser Lys Asn His Ala Met Ile Tyr Ile Glu Ser Leu Gln
 65 70 75 80
 Ala Thr Asn Tyr Gln Gly Asp Ala Glu Asn Thr Val Lys Arg Glu Thr
 85 90 95
 Lys Ile Arg Leu Lys Pro Phe Asn Phe Ser Thr Ile Leu Ala
 100 105 110

<210> 59
 <211> 261
 <212> DNA
 <213> Haemophilus influenzae

<400> 59
 ttgcaattaa aaaaatttat tttagaaact cctgaaaata ttctaactga actttgggga 60
 aattacatta aagatgatcg tataactcaa tgggcaaatt tagtggtatc ttattgtaaa 120
 ccttcaaacc acaatgaaat gaaattaatt ttgacaaaaa ttgtaaatga aaaaacaatt 180
 tttaatgata aagatgatgt aaacaaatta gaagaaatgg caaaaatata cataaccaat 240
 cagaaaatta atagtttata a 261

<210> 60
 <211> 86
 <212> PRT
 <213> Haemophilus influenzae

<400> 60
 Leu Gln Leu Lys Lys Phe Ile Leu Glu Thr Pro Glu Asn Ile Leu Thr
 1 5 10 15
 Glu Leu Trp Gly Asn Tyr Ile Lys Asp Asp Arg Ile Thr Gln Trp Ala

		20						25					30			
Asn	Leu	Val	Leu	Ser	Tyr	Cys	Lys	Pro	Ser	Asn	His	Asn	Glu	Met	Lys	
		35					40					45				
Leu	Ile	Leu	Thr	Lys	Ile	Val	Asn	Glu	Lys	Thr	Ile	Phe	Asn	Asp	Lys	
	50				55						60					
Asp	Asp	Val	Asn	Lys	Leu	Glu	Glu	Met	Ala	Lys	Ile	Tyr	Ile	Thr	Asn	
65					70					75					80	
Gln	Lys	Ile	Asn	Ser	Leu											
				85												

<210> 61
 <211> 918
 <212> DNA
 <213> Haemophilus influenzae

<400> 61
 atgatttttct ctaaaaaataa gtatccacct ttacatgaat tcacgtcatt aatgaataga 60
 gtcgataatt ttcttaataca tgatgcagaa aatagggttg cataactataa gaaacgtagt 120
 ggtattgatt tagaaaaaga tgtatatgag gctatttggt attgtgctca aaatactcct 180
 ttcgaagaca ctattagttt agtatcaggg aaacattttc cagacattgt agctagtcaa 240
 tattatggta ttgaagtaaa aagtacacaa ggagataaat ggacttcaat tggcagttct 300
 attcttgagt ctacacgaat tccaaatata gaaaaaattt tcttaacatt tggtaaatta 360
 ggtggaaata ttaaattcct atccaaacca tatgagtcgt gtttatgtga tatagctgta 420
 acccattacc ctagatataa aatagatatg ttattagaaa agggggagag catatttgaa 480
 aaaatggaga ccacatatga ttctctccga gaattagata atccaataac tcctgtagct 540
 aaatactata aatctctatt aatagaaggt gaaagtttat ggtggacttc aaacaatggt 600
 ttagatgata ttgccctccc caaagttaga cactggaagg taatagaaaa atatgagcga 660
 gatatgtaa ttgctcaagc atatgctttc ttccctgaaa cgatcttagg aaatcctaga 720
 aataaatatg ataaattcgc actatggcta gtgactaaac atggagtaat aaacactagt 780
 ttaagagatg agttttctgc aggagggcaa caaaaaataa ctgatacttg tggtgaaaca 840
 catctttgtt ctgctgtatt aaagagagta gagaacaata ttcttgcaat taaaaaaatt 900
 tatttttagaa actcctga 918

<210> 62
 <211> 305
 <212> PRT
 <213> Haemophilus influenzae

<400> 62
 Met Ile Phe Ser Lys Asn Lys Tyr Pro Pro Leu His Glu Phe Thr Ser
 1 5 10 15
 Leu Met Asn Arg Val Asp Asn Phe Leu Asn His Asp Ala Glu Asn Arg
 20 25 30
 Val Ala Tyr Tyr Lys Lys Arg Ser Gly Ile Asp Leu Glu Lys Asp Val
 35 40 45
 Tyr Glu Ala Ile Cys Tyr Cys Ala Gln Asn Thr Pro Phe Glu Asp Thr
 50 55 60
 Ile Ser Leu Val Ser Gly Lys His Phe Pro Asp Ile Val Ala Ser Gln
 65 70 75 80
 Tyr Tyr Gly Ile Glu Val Lys Ser Thr Gln Gly Asp Lys Trp Thr Ser
 85 90 95
 Ile Gly Ser Ser Ile Leu Glu Ser Thr Arg Ile Pro Asn Ile Glu Lys
 100 105 110
 Ile Phe Leu Thr Phe Gly Lys Leu Gly Gly Asn Ile Lys Phe Leu Ser
 115 120 125

Lys Pro Tyr Glu Ser Cys Leu Cys Asp Ile Ala Val Thr His Tyr Pro
 130 135 140
 Arg Tyr Lys Ile Asp Met Leu Leu Glu Lys Gly Glu Ser Ile Phe Glu
 145 150 155 160
 Lys Met Glu Thr Thr Tyr Asp Ser Leu Arg Glu Leu Asp Asn Pro Ile
 165 170 175
 Thr Pro Val Ala Lys Tyr Tyr Lys Ser Leu Leu Ile Glu Gly Glu Ser
 180 185 190
 Leu Trp Trp Thr Ser Asn Asn Val Leu Asp Asp Ile Ala Pro Pro Lys
 195 200 205
 Val Arg His Trp Lys Val Ile Glu Lys Tyr Glu Arg Asp Met Leu Ile
 210 215 220
 Ala Gln Ala Tyr Ala Phe Phe Pro Glu Thr Ile Leu Gly Asn Pro Arg
 225 230 235 240
 Asn Lys Tyr Asp Lys Phe Ala Leu Trp Leu Val Thr Lys His Gly Val
 245 250 255
 Ile Asn Thr Ser Leu Arg Asp Glu Phe Ser Ala Gly Gly Gln Gln Lys
 260 265 270
 Ile Thr Asp Thr Cys Gly Glu Thr His Leu Cys Ser Ala Val Leu Lys
 275 280 285
 Arg Val Glu Asn Asn Ile Leu Ala Ile Lys Lys Ile Tyr Phe Arg Asn
 290 295 300
 Ser
 305

<210> 63
 <211> 312
 <212> DNA
 <213> Haemophilus influenzae

<400> 63
 ctgttgggcc ccaacaattc cgattctgaa catcatggta atattgaaaa tcgtaggcta 60
 agcatagagc atgaagggaa atatattaac gaattatcta aaggcatgct cgaacgtcgt 120
 cttactataa gagaatgtgc tagattacaa acgttttcctg atagatacca atttatttta 180
 cctaaaacag cagaaaacgt ttctgtttca gccagtaatg cctataaaaat tattggcaat 240
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 tattttaaat ag 312

<210> 64
 <211> 104
 <212> PRT
 <213> Haemophilus influenzae

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 Glu Asn Arg Arg Leu Ser Ile Glu His Glu Gly Lys Tyr Ile Asn Glu
 20 25 30
 Leu Ser Lys Gly Met Leu Glu Arg Arg Leu Thr Ile Arg Glu Cys Ala
 35 40 45
 Arg Leu Gln Thr Phe Pro Asp Arg Tyr Gln Phe Ile Leu Pro Lys Thr
 50 55 60
 Ala Glu Asn Val Ser Val Ser Ala Ser Asn Ala Tyr Lys Ile Ile Gly
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 Asn Ala Val Pro Cys Ile Leu Ala Tyr Asn Ile Ala Lys Asn Ile Glu

85 90 95
 Lys Lys Trp Asn Leu Tyr Phe Lys
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<210> 65
 <211> 1464
 <212> DNA
 <213> Haemophilus influenzae

<400> 65
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 gcaaatagtc aattagccgc attattaatt aaatctggcg cagcaattat tgacaacatg 180
 ggcttactct tcgctgtggg cgctcgctttt gggcttgcaa aagataaaaca cggttccgcc 240
 gcactttcag gccttggttg tttctacgta gtaaccaccc tactttcccc tgctggtgta 300
 gcacaattac aacacattga tattagtga gtgcctgccg cattcaaaaa aatcaataac 360
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 tctttcgtga tgatcgccgt atcatttgcc ttactctata tttggcctca tatttttaac 540
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<210> 66
 <211> 487
 <212> PRT
 <213> Haemophilus influenzae

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 35 40 45
 Leu Ile Lys Ser Gly Ala Ala Ile Ile Asp Asn Met Gly Leu Leu Phe
 50 55 60
 Ala Val Gly Val Ala Phe Gly Leu Ala Lys Asp Lys His Gly Ser Ala
 65 70 75 80
 Ala Leu Ser Gly Leu Val Gly Phe Tyr Val Val Thr Thr Leu Leu Ser
 85 90 95
 Pro Ala Gly Val Ala Gln Leu Gln His Ile Asp Ile Ser Glu Val Pro

			100					105				110			
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Val	Ile	Ser	Ala	Glu	Leu	Tyr	Asn	Arg	Phe	Tyr	Gln	Val	Glu	Leu	Pro
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Lys	Ala	Leu	Ser	Phe	Phe	Ser	Gly	Lys	Arg	Leu	Val	Pro	Ile	Leu	Val
145					150					155					160
Ser	Phe	Val	Met	Ile	Ala	Val	Ser	Phe	Ala	Leu	Leu	Tyr	Ile	Trp	Pro
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His	Ile	Phe	Asn	Ala	Leu	Val	Ser	Phe	Gly	Glu	Ser	Ile	Lys	Asp	Leu
			180					185					190		
Gly	Ala	Val	Gly	Ala	Gly	Ile	Tyr	Gly	Phe	Phe	Asn	Arg	Leu	Leu	Ile
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Pro	Val	Gly	Leu	His	His	Ala	Leu	Asn	Ser	Val	Phe	Trp	Phe	Asp	Val
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Ala	Gly	Ile	Asn	Asp	Ile	Pro	Asn	Phe	Leu	Gly	Gly	Ala	Lys	Ser	Ile
225					230					235					240
Ala	Glu	Gly	Thr	Ala	Thr	Val	Gly	Leu	Thr	Gly	Met	Tyr	Gln	Ala	Gly
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Phe	Phe	Pro	Val	Met	Met	Phe	Gly	Leu	Pro	Gly	Ala	Ala	Leu	Ala	Ile
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Tyr	His	Cys	Ala	Lys	Pro	Asn	Gln	Lys	Val	Gln	Val	Ala	Ser	Ile	Met
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Leu	Ala	Gly	Ala	Leu	Ala	Ser	Phe	Phe	Thr	Gly	Ile	Thr	Glu	Pro	Leu
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Glu	Phe	Ser	Phe	Met	Phe	Val	Ala	Pro	Val	Leu	Tyr	Val	Leu	His	Ala
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Leu	Leu	Thr	Gly	Ile	Ser	Val	Phe	Ile	Ala	Ala	Thr	Met	His	Trp	Ile
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Ala	Gly	Phe	Gly	Phe	Ser	Ala	Gly	Leu	Val	Asp	Met	Val	Leu	Ser	Ser
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Arg	Asn	Pro	Leu	Ala	Val	Ser	Trp	Tyr	Met	Leu	Leu	Val	Gln	Gly	Ile
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Val	Phe	Phe	Ala	Ile	Tyr	Tyr	Phe	Val	Phe	Arg	Phe	Ala	Ile	Asn	Ala
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Phe	Asn	Leu	Lys	Thr	Leu	Gly	Arg	Glu	Asp	Lys	Ala	Glu	Thr	Ala	Ala
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Ala	Pro	Thr	Gln	Ser	Asp	Gln	Ser	Arg	Glu	Glu	Arg	Ala	Val	Lys	Phe
			405						410					415	
Ile	Ala	Ala	Leu	Gly	Gly	Ser	Glu	Asn	Phe	Lys	Thr	Val	Asp	Ala	Cys
			420					425					430		
Ile	Thr	Arg	Leu	Arg	Leu	Thr	Leu	Val	Asp	His	His	Asn	Ile	Asn	Glu
		435					440					445			
Asp	Gln	Leu	Lys	Ala	Leu	Gly	Ser	Lys	Gly	Asn	Val	Lys	Leu	Gly	Asn
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Asp	Gly	Leu	Gln	Val	Ile	Leu	Gly	Pro	Glu	Ala	Glu	Leu	Val	Ala	Asp
465					470					475					480
Ala	Ile	Lys	Ala	Glu	Leu	Lys									
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<210> 67
 <211> 888
 <212> DNA
 <213> Haemophilus influenzae

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ctagaagaaa aattgggtgt gaacctaatc aaccgcacta ctagacagct tagactaaca      180
gaagaaggct tacaatatct tcgtcgcgta cagaaaattc tgcaagatat ggctgcagct      240
gaagctgaaa tgttggcagt gcacgaagtc ccacaaggca tactacgcgt agattcagcc      300
atgccgatgg tgttacatct gctagtgcga ctggcagcaa aattcaacga acgctatccg      360
catatccaac tttcgttagt ttcttctgaa ggctatatca atctgataga acgcaaagtc      420
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gatagccact tccgcgtaat cgccagtcca gactacttgg caaacacagg cagccacaaa      540
tcaactgaag ctcttgccaa ccatcaatgt ttaggcttca ctgagcccag ttcactaaat      600
acatgggaag ttttagatgc tcaaggaaat ccctataaaa tctcaccgta ctttaccgcc      660
agcagcgggt aaattttacg gtcatttgtt ctttcaggct gtggtattgc ttgcttatca      720
gatttttttg tagacaatga catcgctgaa ggaaaattaa ttcccttact tactgaacaa      780
accgccataa aaacgctccc cttcaatgct gtttactaca gcgataaagc agtcaacctt      840
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<210> 68

<211> 295

<212> PRT

<213> Haemophilus influenzae

<400> 68

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Ala Val Ser Arg Val Val Lys Arg Leu Glu Glu Lys Leu Gly Val Asn
 35          40          45
Leu Ile Asn Arg Thr Thr Arg Gln Leu Arg Leu Thr Glu Glu Gly Leu
 50          55          60
Gln Tyr Phe Arg Arg Val Gln Lys Ile Leu Gln Asp Met Ala Ala Ala
 65          70          75          80
Glu Ala Glu Met Leu Ala Val His Glu Val Pro Gln Gly Ile Leu Arg
 85          90          95
Val Asp Ser Ala Met Pro Met Val Leu His Leu Leu Val Pro Leu Ala
100          105          110
Ala Lys Phe Asn Glu Arg Tyr Pro His Ile Gln Leu Ser Leu Val Ser
115          120          125
Ser Glu Gly Tyr Ile Asn Leu Ile Glu Arg Lys Val Asp Ile Ala Leu
130          135          140
Arg Ala Gly Glu Leu Asp Asp Ser Gly Leu Arg Ala Arg His Leu Phe
145          150          155          160
Asp Ser His Phe Arg Val Ile Ala Ser Pro Asp Tyr Leu Ala Lys His
165          170          175
Gly Thr Pro Gln Ser Thr Glu Ala Leu Ala Asn His Gln Cys Leu Gly
180          185          190
Phe Thr Glu Pro Ser Ser Leu Asn Thr Trp Glu Val Leu Asp Ala Gln
195          200          205
Gly Asn Pro Tyr Lys Ile Ser Pro Tyr Phe Thr Ala Ser Ser Gly Glu
210          215          220
Ile Leu Arg Ser Leu Cys Leu Ser Gly Cys Gly Ile Ala Cys Leu Ser
225          230          235          240
Asp Phe Leu Val Asp Asn Asp Ile Ala Glu Gly Lys Leu Ile Pro Leu
245          250          255

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Leu Thr Glu Gln Thr Ala Asn Lys Thr Leu Pro Phe Asn Ala Val Tyr
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 Tyr Ser Asp Lys Ala Val Asn Leu Arg Leu Arg Val Phe Leu Asp Phe
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 Leu Val Glu Glu Leu Arg Gly
 290 295

<210> 69
 <211> 843
 <212> DNA
 <213> Haemophilus influenzae

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 tcagagaaat taagtggcga catttcgaac tatgaattca ccgcacaaaa taatcttact 180
 aaaattacga cattagcaac cacagcggga aaaccaataa accccaaatc ggaaaaatat 240
 catgaagata ttgaaggtat gattaaatta ttcaataaac aaaaagagga gattgaaatg 300
 attattgaag acgccaaccg agcaagcatg gcagggttcgt ttaaaactca atctgaaaat 360
 atcgatagta aaatgaaagc tgtagataaa attttgcctt ggggtcactt gggttgcaaca 420
 tctgttattt cattgttcaa ttattcaaca agcctgagtg cagcagacag ccttaatat 480
 ttacaatttc ttgctaagtc cattgtgaca atcccgttac ttgtcatcgc ctggttgaaa 540
 gcaaaagaac gggcttatct ctttagatta agggaggatt ataactacaa atattcctca 600
 gcaatggcat ttgaagggtta taagaaacaa gtacaagaac aagaccctaa attacatcag 660
 caacttctgc aaattgccgt ggataatttg gggataaatc caaccaaagt ctttgacaaa 720
 gatttaaaaa gcacaccact tgaaacaatt atcgatggag taggaaaacg cctggataaa 780
 gctgttgatg gtattaaagg agaggtgaat gacattccaa agaaaaccaa aagaattaat 840
 tga 843

<210> 70
 <211> 280
 <212> PRT
 <213> Haemophilus influenzae

<400> 70
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 Glu Ile Ser Gln Trp His Glu Gln Ser Glu Lys Leu Ser Gly Asp Ile
 35 40 45
 Ser Asn Tyr Glu Phe Thr Ala Gln Asn Asn Leu Thr Lys Ile Thr Thr
 50 55 60
 Leu Ala Thr Thr Ala Gly Lys Pro Ile Asn Pro Lys Ser Glu Lys Tyr
 65 70 75 80
 His Glu Asp Ile Glu Gly Met Ile Lys Leu Phe Asn Lys Gln Lys Glu
 85 90 95
 Glu Ile Glu Met Ile Ile Glu Asp Ala Asn Arg Ala Ser Met Ala Gly
 100 105 110
 Ser Phe Lys Thr Gln Ser Glu Asn Ile Asp Ser Lys Met Lys Ala Val
 115 120 125
 Asp Lys Ile Leu Pro Trp Gly His Leu Val Ala Thr Ser Val Ile Ser
 130 135 140
 Leu Phe Asn Tyr Ser Thr Ser Leu Ser Ala Ala Asp Ser Leu Asn Ile
 145 150 155 160

<210> 73
 <211> 675
 <212> DNA
 <213> Haemophilus influenzae

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 gatgaacctt caattgaaaa tagaggacaa ttatacatgt ggatgagaga agtaatatct 480
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 gtaaaagaaa ttattgaaca tgattttggt caagctagtg acgaaggata cttaattgta 600
 ccagcttcag tattaatatgc tcagttttat ggagctcttc aatcacgtga gcgtgtcatt 660
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<210> 74
 <211> 224
 <212> PRT
 <213> Haemophilus influenzae

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 35 40 45
 Pro Thr Ser Phe Glu Thr Ile Phe Ala Asn Asp Ile Lys Pro Asp Ala
 50 55 60
 Lys Ala Ala Trp Val Ser Tyr Phe Leu Asp Gln Lys Ala Asn Ala Asn
 65 70 75 80
 Glu Ile Tyr His Leu Glu Ser Ile Val Asp Leu Val Lys Lys Glu Arg
 85 90 95
 Glu Thr His Asn Ile Phe Pro Lys Gly Ile Asp Ile Leu Thr Gly Gly
 100 105 110
 Phe Pro Cys Gln Asp Phe Ser Val Ala Gly Lys Arg Leu Gly Phe Asp
 115 120 125
 Ser His Lys Asn His His Gly Lys Ile Ser Asn Ile Asp Glu Pro Ser
 130 135 140
 Ile Glu Asn Arg Gly Gln Leu Tyr Met Trp Met Arg Glu Val Ile Ser
 145 150 155 160
 Ile Thr His Pro Lys Leu Phe Ile Ala Glu Asn Val Lys Gly Leu Thr
 165 170 175
 Asn Leu Lys Asp Val Lys Glu Ile Ile Glu His Asp Phe Gly Gln Ala
 180 185 190
 Ser Asp Glu Gly Tyr Leu Ile Val Pro Ala Ser Val Leu Asn Ala Gln
 195 200 205
 Phe Tyr Gly Ala Pro Gln Ser Arg Glu Arg Val Ile Phe Phe Trp Phe
 210 215 220

<210> 75
 <211> 6808
 <212> DNA
 <213> Haemophilus influenzae

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<213> Haemophilus influenzae

<400> 80

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<210> 81
 <211> 1961
 <212> DNA
 <213> Haemophilus influenzae

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<210> 82
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 <212> DNA
 <213> Haemophilus influenzae

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gatttatagt	atttagctac	aggagttatt	ggattatcta	attctcggag	agaatcatat	660
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<210> 83

<211> 1516

<212> DNA

<213> Haemophilus influenzae

<400> 83

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 <213> Haemophilus influenzae

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<210> 85
 <211> 1100
 <212> DNA
 <213> Haemophilus influenzae

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<210> 86
 <211> 1055
 <212> DNA

<213> Haemophilus influenzae

<400> 86

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<210> 87

<211> 1048

<212> DNA

<213> Haemophilus influenzae

<400> 87

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